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ARTICLE XXXV.

EPIDEMIC CHOLERA.—A FEW REMARKS ON ITS PATHOLOGY AND TREATMENT.

BY R. DEXTER, M.D., Chicago.

Owing to the double interest of an epidemic being upon us, and so many of its principles lying concealed in the mysteries of pathology, a few observations from almost any one may be acceptable.

As its great importance has engaged the best energies of many able and distinguished investigators of both continents, it might well seem presumptuous in me to hope to contribute anything worthy of the consideration of the profession, were it not that the constant progress of physiology and pathology is such as to open up new avenues for inquiry, and ever affording fresh facilities for pursuing them. This subject involves many facts which lie at the very foundation of these sciences, and many others which can only be deduced from analogy, while some remain, as yet, unexplained. The difficulties in its study do not seem to depend so much upon a want of observation, as upon its hidden primary cause and complicated actions. If we carefully trace the gradual digression from a truly physiological action through the entire changes of

its pathological course, in a typical case of cholera, we will find about the following order of events:—

1. Slight derangement of alimentary canal, muscular languor and tremulousness, restlessness, headache, and anorexia.

2. An enhanced condition of the preceding phenomena, with abdominal uneasiness, perhaps actual vomiting and purging, tongue coated, cramping in distal and peripheral parts, arrest of secretion of urine, with coldness of surface.

3. Active vomiting, purging of the characteristic rice-water dejections, respiration labored, excessive, and painful, cramping of both body and extremities, great coldness of surface, and pulse variable.

4. Dyspnœa very great, peripheral circulation nearly suspended, venous congestion, labored cardiac action, skin livid, cold, and bathed in perspiration, great precardial pain, and coolness of respired air.

5. Low irritative fever, with an irritated and *congested condition* of one or more vital organs.

Many prominent men claim that the specific action of the cholera poison is upon the capillary circulation, some say pulmonary, others, general. To this I must, in part, disagree. That the capillary system is affected, is unquestionably correct; but it seems to me that there is as much evidence to confirm an opinion that its primary action is upon the nervous, glandular, or cellular systems, or that it acts, through the blood, upon any other system, as upon capillaries alone. Now, my belief is, that as soon as any poison has entered the blood, it acts upon its composition and changes its constituent elements; that it changes the constituent elements of the cells and their contents; that this modifies *absorption* and *secretion*, and thus alters *assimilation* and *excretion*.

That all known hæmatic poisons have some individual peculiarities, but many properties in common; and that all poisons taken into the blood must be eliminated by some of the emunctories; and that they have a specific predilection to escape from one or more eliminating systems, and when these are dormant that a compensating action is established, by which the other

systems of emunctories eliminate what the disabled ones failed to expel. These principles are as well illustrated and as well settled, in regard to the elimination of poisons, as they are in the more ordinary every-day work of excretion.

I will here cite the action of antimony, and compare it with that of the cholera poison, assuming that they are both taken into the blood slowly, but gradually increased in amount, so that the antimony is received into the system about as cholera poison usually is, and their similarity in many respects will be very apparent. Their analogous effects are:—1. Prostration. 2. Irritation of the alimentary canal. 3. Impaired function of pneumogastric and other organic nerves. 4. Impoverishment of the blood. 5. Lowering of animal heat. 6. Excessive vomiting and purging, and, 7. Cold, clammy perspiration. Their differential actions are:—1. In cholera, there is a greater tendency to spasms, causing an early suspension of function, and thus preventing the elimination of its poison. 2. A stronger tendency to recession of capillary fluids to internal organs, and this want of fluid in the capillaries results in an endosmatic action from the surrounding tissues. 3. This overloading of larger veins forces the watery portion of the blood through into the bowels, and, hence, the *rice-water dejections.* That there is, in cholera, an early arrest of functional and capillary action, and, consequently, of elimination, is proved by the following conditions:—

1. An arrest of secretions, *e.g.*, urine and bile.
2. A gradual subsidence of animal heat.
3. An imperfect aëration of the blood.
4. Undue fulness of larger vessels.
5. Conditions of nutrition and disintegration in those who recover from its first stages.
6. Excessive nervous irritation.

Judging from the above facts, it seems to me that the indications for treatment are as patent as are the principles of medicine. They are to restore the action of the emunctories by recalling the receding capillary circulation. If this is accomplished, nature herself will be adequate to the task of elimina-

tion and restoration. The truth of the foregoing statements has been abundantly verified in our own practice. The above indications may be fulfilled by:—

1. Allaying nervous irritation.
2. By artificially restoring animal heat.
3. By a proper administration of the true eliminating medicines.

Nervous irritation is probably best allayed by opium in regular and sustained stimulant doses, until capillary action is provoked. Perhaps the preferable preparations are the tinct. and camph. tinct. opium, with such modifications as the case requires; if the discharges are excessive, with injections of plumbi acet. and morph. acet. The best artificial method of restoring animal heat, is to completely envelope the patient (excepting his face) in wet blankets, as hot as can be tolerated, and these hot envelopes are to be changed as often as their temperature is appreciably diminished. We should, also, (if the case proves in any way obstinate,) strictly enjoin recumbent rest, with sinapisms to the epigastrium and præcordia, and administer ice and ice-cold water, to be swallowed every few minutes.

As soon as the excessive cramping, vomiting, and purging has subsided, administer the true eliminatives, those that will not only call into action the stomach and bowels, but the skin, lungs, kidneys, liver, absorbents, in fact, every conceivable method of judicious elimination.

My selection is usually a mercurial one, because it, *per se*, has the very effect we should produce—cathartic, catalytic, and eliminative. Camphor and ammonia, I find very useful. They materially aid pulmonary, cutaneous, and urinary elimination, and tone up the depressed pneumogastric and other organic nerves. In my practice, heat and moisture have overcome the congestion of the kidneys and liver better than anything else. I apply hot wet cloths to the lumbar and hypochondriac regions.

The above is a concise statement of my plan of treatment, with the principles upon which it is based, and the objects intended to be accomplished. I will here give notes of cases

subject to this plan of treatment in my practice, with a success truly flattering, and one that the profession can repeat:—Of 78 cases, 63 were treated upon this method at the commencement of the cramping and rice-water dejections, and all recovered. Of the remaining 15, who were not seen until much later in the disease, (bordering upon collapse,) only 6 died.

For a further consideration of the elimination of hæmatic poison, the reader is referred to Dr. HEADLAND'S work on the Action of Medicine, chapter on eliminations; and Dr. WILLIAMS' Principles of Medicine, section on toxemia. The plan, so highly recommended by some authors, of allowing the emetic and cathartic action to continue, or even increasing it, whilst it has some show for elimination, seems to me to hasten collapse and cut off the chances for general emunctorial excretion; and we thus seem to get a pell-mell elimination instead of an elective one. Chloroform, I think, is contra-indicated by a highly carbonized condition of the blood, by an already embarrassed condition of the organic nerves, and by an oppressed condition of the heart and lungs. [See GROSS' System of Surgery, third edition, pages 539 and 540.]

In a state of collapse, when the watery portion of the blood has been drained away by the excessive evacuations, and where prostration marks every organ of the body, it is my opinion that little can be done, except by supplying such nourishment as requires but little digestion, and that will serve to sustain vital and recuperative action—beef-essence, fresh milk, coffee or tea, as the patient is accustomed, chicken broth, etc. Perhaps I ought here to mention some of my reasons for considering the rice-water dejections the result of pressure. They are: 1. The abdominal veins are congested, and with such congestion we always have an aqueous exudation. 2. Anatomically, this is the most free exudating surface. 3. Hydrogogue cathartics are probably exuded into the lower portion of the intestines, as a result of congestion. 4. Nervous shocks, as fear, cold, and the like, produce such action, especially when the kidneys are inactive, as is the case in cholera.

ARTICLE XXXVI.

OBSERVATIONS ON SCURVY, AND ITS CAUSES AMONG THE U.S. COLORED TROOPS OF THE 25TH ARMY CORPS, DURING THE SPRING AND SUMMER OF 1865.

BY S. HEMENWAY, M.D., late Surgeon 41st U.S. Colored Troops.

During the siege of Richmond, Va., and afterwards in the winter of 1864-5, and the following spring, I had occasion to observe the cause, or rather a combination of causes, to which may be attributed the general appearance of scurvy throughout the 25th Army Corps, upon the arrival of this command in Texas, in June, 1865.

The expedition left City Point, Va., about the 1st of that month. I was informed by Dr. NORTON FOLSOM, Medical Inspector, when he was on an inspecting tour through the Western District of Texas, during the month of September, 1865, that about 60 per cent of the whole strength of the corps had been afflicted with scurvy during the summer. The mortality percentage I do not remember to have heard him say; but a report of sick, during the month of August, 1865, at Edinburg, Texas, shows the number 89, from a command of 1000 men, as having been treated in *hospital;* and from my own personal observations in the hospital during that month, all, or nearly all, had scurvy or some other disease complicated with it. The number of deaths reported was 10, and nearly all the result of a scorbutic condition of the system. So it will be seen, the percentage of mortality, with reference to this part of the command,) which I think can be taken for far better than the average,) was 11 per cent of the whole number of patients treated in hospital. Large numbers were sick from scurvy in *quarters*, and, of course, cannot come under the calculation of those treated in *hospital.* Suffice it to say, that often more than one-half, and sometimes three-fourths, of a regiment were afflicted with scurvy, and were cared for as well as circumstances would

permit in *quarters*, in consequence of insufficient hospital accommodations for such large numbers.

This evil had to be remedied, and there were, at the time the colored troops landed in Texas, (in the month of June, 1865,) scarcely any medical supplies, and the quality of the rations for the men *very poor*. As fast as the men were landed at Brazos Santiago, there were, from each U.S. transport, from 50 to 100 of the *worst* cases of scurvy sent to the post-hospital, which was in my charge, and then the only hospital for the whole army of the Rio Grande, having the capacity of 80 beds only. Within one week, there were no less than 500 patients, (chiefly scorbutic,) a few within, and many lying around the hospital buildings, without shelter, in the open air, upon the sand, and supplied with a limited quantity of condensed water, with now and then a supply of fresh *muddy* water from the Rio Grande.

Some 200 or 300 of these patients were immediately sent back to hospitals at New Orleans, but the number of sick again rapidly accumulated upon the arrival of each succeeding transport, and in less than three days the number of patients far exceeded the former. By this time, we had hospital tent-flies up, sufficient to protect several hundred patients in an overcrowded manner. This condition of affairs could not be tolerated for any length of time, and a request was made to have more sick sent away, in order to have room for the number that could be actually accommodated with sufficient space for beds under shelter. I feel justifiable in pronouncing all of these cases scurvy, as I failed to discover, with but very few exceptions, any other disease which was not more or less complicated with a scorbutic condition of the system.

So far as I noticed, the chief characteristic symptoms were a weakened and debilitated state of the system, with emaciation, particularly in those cases accompanied by excessive discharges from the bowels, oftentimes of a dysenteric nature, and sometimes merely a diarrhœa; the gums were very much swollen and projecting over the intervals between the teeth, very similar in size and shape to the ends of one's fingers, and of a dark red or purplish hue, and frequently of a com-

pletely black color. These projecting or impending columns of swollen gums very closely approximated each other, and sometimes coalesced, entirely hiding the lateral view of the molar, bicuspid, and canine teeth. Extensive ulcerations of the gums was a universal concomitant, and attended with frequent bleedings. Over various parts of the surface of the body and extremities, there could be detected extensive and diffused ecchymosis, also a dropsical condition of the feet and legs, usually attended with severe pain, sometimes in the joints, simulating rheumatism, and frequently along the continuity of the shafts of the bones of the lower extremities. Vesications were frequently noticeable, from which oozed serum and blood, oftentimes becoming foul ulcers. The muscles of the calf and thigh of the extremities were frequently found to be indurated, and the joints, particularly the knee and ankle, anchylosed.

These patients were universally dejected in spirits, and death ensued after much muscular exertion, or (the patient's appetite being capricious) from hemorrhage, which, in all probability, was induced by excessive and sudden congestion that would inevitably take place during the process of digestion, which must necessarily be more active than is usual during any period of the disease, in consequence of the quantity and quality of the ingesta which the patient happened to be allowed to take. One case, in particular, of the latter kind, I was informed of, as having occurred in one of the wards of the post-hospital at Brazos Santiago. Deaths among scorbutic patients sometimes occurred from pulmonary œdema of passive origin, dependent on the morbid state of the blood.

The *cause* of the appearance of scorbutus among these troops cannot, I think, be attributed *alone* to the short voyage, during the month of June, 1865, from Fortress Monroe, Va., to Brazos Santiago, Texas. There were a few well-marked cases noticed while the troops were encamped near City Point, Va., in May last, before embarking on this expedition. The voyage, however, may have been, and doubtless was, the chief exciting or secondary cause in the developement of scorbutus, dependent on the previous existing causes and the general physical condi-

tion of the troops at the time of embarkation. The spaces between decks, into which they were crowded, were commonly dark and illy ventilated, thus constituting the chief exciting or immediate cause.

In one of my weekly reports, in the month of May, when we were encamped near City Point, Va., I reported one case of scorbutus, and stated in the remarks, that I was fearful more cases would shortly be developed. It too frequently happened that in every issue or two of rations, a portion would be found damaged, for example, wormy hard-bread and a damaged condition of beans, rice, and pork. The supply of fresh vegetables was very meagre. The *dessicated* vegetables, these soldiers, as a general thing, disliked very much, and most of them would not partake of the preparation cooked in any manner. Such was the character of the food upon which they subsisted during the previous winter, with the exception of a very bad quality, generally speaking, of fresh beef, issued perhaps once or twice a-week—bad quality, I say, because the beef cattle were not usually in the very best order for beef. It is a well-known fact, how neglected has been the care of beef cattle during their transportation by railroads and steamboats, in not giving them a proper supply of water, or depriving them entirely of it during the whole trip. Of course, the result was a state of exhaustion, and a febrile condition among the cattle was induced, and in this state they were driven off to slaughter-pens, there to be butchered and distributed to the soldiers. Other causes, which may be secondary to this defective mode of subsistence, may be added, such as excessive and long-continued fatigue duty, together with almost constant exposure to damp and cold during the long, wet, winter season. The huts which were built for winter-quarters, were generally very dark, damp, and cold, and the supply of fuel insufficient. Many of these soldiers became despondent, and would not put forth the least effort to make themselves comfortable, but would sit or lie down upon the cold, damp ground, within their huts, without a spark of fire, and most always with their clothes pretty well saturated with water. The water used for drinking purposes was very impure,

it being always taken from filthy sloughs, surface-water wells, or some surface-water stream, the washings of old, filthy camp-grounds, etc., etc. Hence, it will be seen, from the statement of these facts, that the cause of the prevalence of scurvy among these troops is very much complicated.

It was remarked by some medical men, after the general appearance of scurvy among the troops in Texas last summer, that they believed that many cases reported as rheumatism, during the winter in front of Richmond, Va., were, in reality, scurvy, of which I have not the least doubt.

When our command landed in Texas, in the month of June, 1865, our means for treatment were very limited for many weeks. The rations issued continued to be of the very worst character, and the water (condensed sea water) poor in quality and small in quantity. As soon, however, as the troops made their way into the interior, they began to improve; and as soon as fresh vegetables were supplied, even in as limited quantities as they were, scurvy began to rapidly decline.

Medicinal agents were tried to some extent. From the use of muriated tincture of iron alone, I have witnessed a gradual improvement in the condition of patients; also from some of the salts of potash—the iodide of potassium in conjunction with chlorate of potash; also topical applications, in the form of lotions, directed to be used for the ulcerated condition of the gums; sulphate of zinc and alumina, but never so rapidly effected as from the juices of fresh vegetables, administered internally.

After the general appearance of scurvy, during the month of June, 1865, it continued to increase rapidly through the following month, after which it began to decline, at first, slowly, and, I think, by the middle of last November, the disease had almost entirely disappeared. This decline of the disease was in consequence of supplies of fresh vegetables furnished, notwithstanding the limited quantities in which they were issued.

A great deal of credit is due to the use of the juice of the plant "*Agave Americana*," indigenous in Mexico, on the border of which country our troops were stationed. A description

of the plant is given in the Appendix of the U.S. Dispensatory. I have employed it with some degree of satisfaction, but I cannot say that the good results depended *entirely* upon this remedy, as the scorbutic patients were supplied at times with a few fresh vegetables, such as raw potatoes and onions sliced in vinegar, and pickled cabbage, and thus supplied, the improvement was always, I noticed, much more marked.

ARTICLE XXXVII.

TAPE-WORM.—(*Tænia Solium.*)

By J. V. HERRIOTT, M.D., Valparaiso, Ind.

The following case of tape-worm tends to strengthen the reputed efficacy of pumpkin seeds (*cucurbita pepo*) in expelling tape-worm from the human intestines:—Geo. G., *æt.* 24, presented himself at my office, June 7th, 1866, complaining of having been "sick for two years," and wished to know, "what is the matter with me?" He had dyspeptic symptoms, with colic pains, especially after eating; had a gnawing, craving sensation for food, the attempt to gratify which, produced satiety and sickness; said he had been passing "worms" for the last two years; had nervous tremors, and was weak; could not endure work from one meal to another, on account of weakness; said he was getting worse all the time, and now could "work but little." Upon his describing the "worms" passed, I diagnosed tape-worm, and requested him to bring me a specimen, which he did, an examination of which confirmed me in the diagnosis I had made.

I directed him to take two ounces of the kernels of pumpkin seeds and make them into an emulsion with sugar and water, and the next morning, fasting, to take all the emulsion at once, and in two hours to take two tablespoonfuls of castor-oil, with one teaspoonful of spirits of turpentine, and to repeat the dose in two hours more, if the first did not operate. The first dose

started the worm from his moorings, and three feet were discharged; but he, being anxious to complete the "job," repeated the dose, and in a short time sixteen feet were discharged, which he brought to me at midday, preserved as directed. On careful examination, the head was not found on either end of the worm; I, therefore, directed him to repeat the treatment, which he did, but without further development of worm.

This man said he had passed at least six inches of "worms" every day for the last two years; sometimes dropping down into his boots while at work. The passing of segments of the worm was, no doubt, the means of keeping him up as long as it did, for, if one-half of the length he says he passed had been retained in the intestines, grave symptoms would have been manifested much earlier.

There is one fact more in this case, which has a bearing on the etiology of tape-worm. Having observed that Dr. CABBOLD expressed an opinion before the British Association, "that tape-worm is often contracted from eating beef and veal," I questioned my patient on this point, and elicited the fact that in the fall of the year before he began to pass the segments, (which was in the spring,) he was in the habit of eating raw beef, for which he says he has a strong relish. We further remark, only, that since the expulsion of the worm, this man appears to have new life and energy infused into him. He feels well, eats well, sleeps well, and works well.

THE BANEFUL EFFECTS OF NICOTINE PREVENTED.—M. Melsens has found that tobaccos, from various countries, contain nicotine in very different proportion. In tobacco from some parts of France (*e. g.*, the department of the Lot) there is 7.96 per cent. of nicotine; whilst Havana tobacco contains only two per cent. He proposes to smokers a way of preserving them from the effects of the alkaloid, and advises them to put into the tube of the pipe or cigar-holder a little ball of cotton, impregnated with citric and tannic acids. As the smoke passes through the cotton, it will deposit the nicotine therein, in the shape of tannate and citrate. M. Melsens has made very ingenious experiments which go a very great way to prove that he is perfectly correct.—*Lancet.*

ARTICLE XXXVIII.

REPORT ON CEREBRO-SPINAL MENINGITIS.

By J. S. JEWELL, M.D., Prof. Anatomy, Chicago Medical College; Member of Illinois State Medical Society; etc., etc.

Read to the Illinois State Medical Society, June, 1866.

ACKNOWLEDGMENT.

To Drs. J. M. WOODWORTH and E. O. F. ROLER, who have kindly exerted themselves, while engaged in foreign study and travel, to procure for me European monographs on the subject of this report; to my colleagues, Profs. JOHNSON and BYFORD; and to my friends, Dr. E. MARGUERAT and Mr. EPPLER, of this city, my especial thanks are due, for valuable assistance rendered. The latter gentlemen translating for me a number of German monographs.

Within the past few years, a disease has made its appearance in various parts of the United States, pursuing, as a general thing, a rapid course, not very amenable to treatment, and attended by a fearful mortality; and in which the cause, whatsoever it may be, has seemed to expend its influence, mainly, on the contents of the cerebro-spinal cavity.

The disease was comparatively new to most of the practitioners of this country, and from this cause, and its widespread or epidemic prevalence and unusual mortality, it excited, very naturally, much attention among physicians, and alarm among the people. That the disease has frequently occurred both in Europe and other parts of the East, and in our own country in times past, will appear from a brief view of its history.

In giving an historical sketch of a disease about which so many opinions have been and even now are held, it will be necessary to keep in view, not only the chronological order of such occurrences of the disease as shall be given, but a more or less critical examination should be made of the reputed occurrences of the disease for reasons which will appear hereafter, and in which the attempt shall be made to eliminate all doubtful examples of its occurrence, that in this way an evident source of fallacy may be avoided. For the disease under con-

sideration has often been confounded with other forms of disease distinct from it, and *vice versa.* But while an eye will be had to this matter, no formal attempt at a critical history of the disease will be made in this report.

In the historical sketch which follows, I shall first trace it in the Eastern Hemisphere, and, subsequently, in the United States. I will make no pretensions, here, to give all the occurrences of the disease that have been recorded, or that I have in my possession, but examples will be given from each well-marked epidemic. The sketch which follows, has been collected from a great variety of sources, both in this country and Europe, none, so far as I am aware, giving a consecutive history of the disease:—

HISTORY IN THE EASTERN HEMISPHERE.

From the best information I have obtained, it appears "cerebro-spinal meningitis" has prevailed epidemically in Europe and adjacent parts, chiefly in the south part of Europe, as follows:* In 1310, in France, which has seemed to be its favorite district in the Eastern Hemisphere. Then, in Europe again in 1503, 1510, 1516, 1517, and in 1528 once more, and was *this* time the precursor of the plague. In 1553, it appeared in Silesia, and carried off large numbers of the people. In 1556, it was observed in England and France; in Spain, in 1557, where it proved fearfully fatal; and in 1559, at Palermo, in Sicily. It occurred in many places in 1564. From 1569 to 1574, it prevailed in many parts of Europe, and was again followed by the plague. According to OZANAM, it appeared in 1580 at Rome, associated with a catarrhal affection, and swept away not less than 12,000 persons; and in like manner, 12,000 at Venice; and 2000 at Madrid, in Spain. In Europe again, in 1582. It was observed at Trent in 1591, and in 1592 at Florence. In various parts of Europe, in 1616 and 1624. It is reported by SYDENHAM, in 1661, as partaking of the charac-

* I have not been able, as yet, to obtain the report of Dr. BURDON SANDERSON, made to the British Parliament, on the disease as it appeared on the Lower Vistula; nor the elaborate monograph of MANKOPFF'S, which has been, or is to be, published at Vienna, in Austria, but *will* soon as possible.

ter of typhus. In Italy, in 1691 and 1693, and in England, in 1698. In Prussia, in 1704, and again in England, in 1710 and 1741. In Piedmont, in 1720, in Egypt, in 1760, and again in Europe, in 1761. According to MARTEAU DE GRANDVILLIERS, at D'Aumale, in 1757 and in 1778, coincident with an epidemic of typhus at Lyle; and again, in 1778, in other parts of Europe. In 1805, it appeared at Geneva; then at Melazzo, in Sicily, in 1808, where, according to one BOYLE, the most common characteristic seems to have been plastic effusion within the cerebro-spinal cavity. In 1814, it appeared at Grenoble, and was reported on by Mons. BILLERY, and after this occurred at Vesaul, in 1832.

In 1837, it appeared at the military hospital at Bayonne, where 33 persons soon fell victims to the disease. From this date, the disease spread northward through France, in two directions, and, during the time of its progress, no less than 57 epidemics are reported, many of them attended by an alarming fatality. Of the two paths of progress of the French epidemics, one extended along the eastern, and the other along the western border, penetrating but once into the interior of the country.

The western path began at Bayonne, as already related, and extended over Bordeaux to the Loire, visiting La Rochelle and the province of Landes, Dax, etc. It extended up the Loire, on either hand, into the interior, of which this was the only example. It then appeared at Brest, Cherbourg, Caen, and other places on or near the coast, in 1840 and 1841, and from these places it extended onward to Versailles, about Lothringen, Elass, and Languedoc. Between 1839 and 1842, it appeared at Metz, Strasbourg, Nancy, Colmar, and, still farther, at Laval, Chateau Gonthier, Tours, Blois, Joigny, and in the neighborhood of Rambouillet.

Following the other branch, which began at Narbonne and Foix, and dates at 1837:—In 1838, it appeared at Toulon, and early in 1839, at Nismes, and in the winter of this and the following year at Avignon. Here, it was mainly confined to the military, as in some other parts of France, though it appeared

many times among the civil population. It was then seen at Mont Brison, in 1840 and 1841. The winter following, at Aigues Morte, and, occasionally, elsewhere, until 1849.

In Italy, the disease appeared in 1837, at Terra Di Savolo. It then extended to Calabria Ulteriore, and Principato Ulteriore, and also was observed at Naples, in which latter place it again appeared in 1846, and in various parts of Sicily. Since then, the disease has, until lately, not prevailed in Italy. In the winter of 1865, it reäppeared at Nizza and vicinity.

It was observed in Algiers from 1839 to 1847, especially the eastern part, and from here it extended toward the great Sahara desert.

Besides the places already mentioned, it appeared at Gibraltar in 1844, mainly confined to the native population.

From 1845 to 1848, it prevailed with great malignancy in Denmark. In 1846 and 1847, it was observed in Ireland, especially in the vicinity of Belfast, as reported by Dr. R. MAYNE, and also at Edinburgh, in Scotland. From 1854 to 1861, it prevailed in a large number of places in Sweden, also at a few places in Norway, and, about the same time, among the troops from Holland, at Anheim. The disease was observed by REINACHER, at Wrisburg, in 1851. In 1863-4-5, it appeared in many parts of Germany, but especially the Dantzig district of West Prussia, as related by HIRSH, RUMMEL, and others, where, perhaps, 2000 cases occurred; and, also, less extensively, in other parts of West Prussia, as at Berlin, Bromberg, Stettin, etc.; and farther east, in the Grand Duchy of Baden, at Carlsruhe, and Rastatt, as related by NIEMEYER, of Tubigen.

HISTORY IN THE UNITED STATES.

Let us now turn to its history within the limits of the United States. Though I have somewhere seen a statement of its earlier occurrence, yet the earliest recorded occurrence of the disease in this country which I now have at hand, is that at Medfield, in Mass., in 1806, and, again, in Litchfield County, Conn., in April, 1807. From this time, during the years of 1807-8-9-10, it was observed, winter and spring, at many places in the New England States and New York, and by 1810-11 the

disease had begun to prevail extensively and with great severity, in New England, New York, and Canada. In New England it reached, perhaps, its highest degree of prevalence during the year last mentioned. From this period the disease began to decline, and, finally, in the course of a few years disappeared as an epidemic. This epidemic was reported on by many observers, among whom were GALLUP, NORTH, WARREN, WELCH, STUART, THACHER, HOSACK, MINER, and TULLY, etc. It was coincident with a marked typhus constitution, and cases were frequently complicated with pneumonia and pleuro-pneumonia.

Between 1840 and 1850, it prevailed epidemically in many parts of the Southern, Middle, and Western States, as in Alabama, Tennessee, Kentucky, Missouri, Illinois, Indiana, and Michigan. Since that time, the disease has not appeared epidemically, so far as I can learn, or, at least, notably so, until since the beginning of the late war. From the winter and spring of 1862-3, the disease has prevailed in a large number of localities, both North and South, and many times, but especially in the Southern States, attended by a fearful mortality. Happily, at this time, the malady has subsided as an epidemic, though sporadic cases are not unfrequently met with.

Accounts by various observers have been given of the late epidemics in this country and Europe, but few of them, however, for various reasons, satisfactory as desirable; and to these reports, and to such accounts of earlier epidemics as I have been able to possess myself of, or the *facts* they give us, let us now turn our attention.

MANNER OF TREATING THE SUBJECT.

Before I go farther, it may be well for me to say something about the method I have adopted in treating this subject. I have obtained many of the most important reports, both in Europe and this country, and where I have been unable to consult a report directly, I have frequently done so through friends who had access to them. The matter I have thus become possessed of has been analyzed, and all facts of the same kind or order arranged under appropriate heads. Four tabular statements of facts were made in this way; the first, exhibiting the

symptomatical; the second, the *post mortem;* the third, the etiological and pathological; the fourth, the therapeutical histories of the disease. From these analyzed statements, the body of the report has been drawn. Following this, is a discussion of the facts, in which the attempt is made to evolve their teachings. In each statement, room was left for incidental facts and exceptional cases.

In the examination I have made into the literature of this subject, I have remarked such a contrariety of opinion, as to its nature, etc., in cases where an opinion has been offered at all, and such a difference in the appearance of the disease in some particulars, as it is described by various observers, as to impress me with the belief it was necessary to make a broader survey of the disease, as it has appeared at various times and places, and, in this way, to collect a greater number and variety of facts than has been customary with those who have considered this subject; that in this way an evident source of fallacy may be avoided, and a broader foundation laid for sound deductions.

In an inductive science like medicine, *facts* lie at the foundation of true advancement, and in proportion as they are numerous, in the same degree are we likely, all else equal, to reach truthful conclusions. For the purpose of obtaining such a body of facts as might lead to sound conclusions, I have taken some pains to collect them; and in going to all available sources, I have done so, actuated only by a feeling of the above-mentioned necessity.

And surely, a disease which has occurred so often, and concerning which there is such a body of material within reach of the profession, but of which the profession, as a body, knows so little, and which has been so imperfectly understood, has proved so intractable to treatment, and which involves so many interesting questions in pathology. I say, surely such a disease demands a careful study. For these and other reasons, I have felt compelled to extend this report beyond what I had originally intended as it limits.

I. SYMPTOMATICAL HISTORY.

1. Premo itory Symptoms.—It is pretty well agreed among observers that there are no well-marked premonitory symptoms which may be regarded as characteristic of the disease. Many times, from a state of apparently perfect health, the patient is seized with the disease, and without warning. *E.G.*, M. TOURDES saw premonitory symptoms in 44 cases out of 73. HIRSH relates, that out of 40 cases, 24 had similar premonitory symptoms, 16, however, had none, and some were, as stated above, attacked *ab initio*, with the fully developed disease, even while at their ordinary avocations.

But, generally, the attack is sudden. The most constant of the *early* symptoms is that of *chilliness*, which sometimes amounts to mere rigors, but more often to a severe chill. NIEMEYER has seen cases occur without a perceptible chill, but such cases must be very rare.

Another symptom, almost constantly present, is *pain in the head*, extending frequently down the back of the neck, or even down the full length of the spinal column. HIRSH noticed pain in the abdominal walls, as one among the earliest symptoms. Drs. SKIVEN, GREENE, and others, have noticed pain in the knee, or some part of the extremities, before pain in the head; but in almost every case it has soon appeared in the head, and from thence has frequently extended to the back and extremities, especially the lower. There is sometimes, quite early, soreness in the back of the neck and elsewhere.

Nausea and *vomiting* have also been observed as among the earliest symptoms, as well as most common. The bowels have generally been *normal* or *constipated*. Some *few* observers, however, have reported severe purging, like in cholera or cholera-morbus. But my enquiries show any form of looseness of the bowels to be rare.

Sometimes there is a sense of stiffness and soreness about the throat, as recorded by GALLUP, and stiffness of the muscles of the face and neck, and sometimes slight paralysis of the tongue was observed by Dr. UPHAM.

Delirium, although not so early as the symptoms already

referred to, is, yet, very soon, one of the most constant and characteristic symptoms of the disease, and, in a few cases, is soon followed by coma, or even may be preceded by *coma*. Dr. ARMSTRONG, of Mobile, saw the delirium commence with extreme suddenness and violence.

The *pulse* is, *generally speaking*, diminished in force and volume, and increased in frequency. The *surface* is usually paler than natural. The condition of the *pupils* not changed or variable. Such are the most prominent of the early symptoms. Others have been reported, but they are not sufficiently constant to deserve attention.

All the premonitory symptoms indicate a most serious involvement of the nervous system, especially the cerebro-spinal, and point, unmistakably, to those parts as the seat of the disease in which, as we shall see, *post mortem* examinations reveal the greatest changes.

2. Surface.—In the beginning of almost every case, the *temperature* of the surface is lower than natural, and in some virulent cases remains so till death. After reaction occurs, the heat of the body generally does not rise much above what is natural, though, in a few cases, it becomes excessive. In the cases observed by HIRSH, the temperature was not, on an average, perceptibly increased above natural, as indicated by the thermometer in the axilla.

The *moisture* of the skin has been variable. Sometimes it is dry as well as cool, as observed by ALLEN and others. 25 per cent of the cases observed by the gentleman last named, are said to have presented a moist skin. According to RUMMEL, after the disease had progressed a few days, occasionally profuse perspiration occurred at irregular intervals, sometimes only partial, as on the head and face, at other times over the whole body.

The *color* of the skin has been variable, perhaps, most frequently nothing remarkable. In the beginning of the disease, it is generally paler than natural; especially is this true of the face. The surface has sometimes been observed of a cyanotic hue, as by HIRSH and OSTER. Sometimes the face is flushed

after reaction, as in the cases reported by UPHAM and others; rarely so from the beginning. It is owing to the fact that *maculæ* or *spots* of various kinds appear on the skin occasionally in this disease, that it has its name "spotted fever." Spots of various kinds have been observed in this disease, chiefly as follows:—

Petechia have been most frequently observed. They vary much as to time of appearance, extent, color, and duration. They seldom appear at the commencement of the disease—frequently about the second or third day or later—while, in the majority of cases, they never occur with any distinctness at all. They seldom are copious, and generally are confined to the neck, breast, and arms, appearing frequently on other parts of the body. As to color, they vary from red to a purple or dark color, and may appear at almost any period, and disappear at any time after their occurrence. They have sometimes been observed to persist until after death. They vary in size from a pin's head to half-an-inch or more in diameter. They are generally distinct, though they may be confluent. They are seldom elevated, and do not usually disappear on pressure. Most observers agree they are not pathognomic, and that their appearance or disappearance has no marked import, either in diagnosis or prognosis. Some observers who have met the disease have not seen them at all. NIEMEYER observed them occasionally in the epidemics at Carlsruhe and Rastatt. RUMMEL and HIRSH saw them very seldom in the Dantzig epidemic. They were observed by FORGET at Val de Grace but seldom. BROUSSAIS and LEVY mention them in a few cases. They were seen more frequently by BOUDIN, MATTOT, TOURDES, and LEFEVRE, and among the older writers, they are mentioned by PRINGLE, HILDENBRAND, and others.

In the epidemic which prevailed in the New England States, between the years of 1808 and 1812, they were observed by Dr. GALLUP, about one time in six, distinctly. They are mentioned as frequently seen by Dr. NORTH, and those to whom he refers, in his work on "Spotted Fever." In our own late epidemic, they were more frequently seen than in the contempo-

raneous epidemics in Europe. They are mentioned by numerous observers, as GREENE, GERHARD, DRAPER, UPHAM, LEVICK, ALLEN, and others, who have recently communicated their observations to the medical journals of the country.

As regards the character of the spots, they seem, generally speaking, to be extravasations beneath the skin, and are seldom elevated to the same degree they often are in typhus. They seem *sometimes* to be simply congested spots, which more or less disappear on pressure—the former do not disappear thus.

Herpes Labialis.—After the spots referred to in the last paragraph, herpes has been most common. Most observers in Europe speak of it. It has been noticed by FORGET in a large number of the cases which came under his observation. The same happened in NIEMEYER'S cases. HIRSH and RUMMEL saw herpes frequently in the Dantzig epidemic; also M. LEVY, at Val de Grace. The eruption has generally appeared about the mouth, and on various parts of the face, extending from thence to the ears, neck, etc., rarely farther. It appears at irregular times, and seldom in the rapidly fatal cases. It generally occurs in those cases which have several days' duration and are distinctly febrile in character.

Occasionally other eruptions, as roseola, occur. OSTER and HIRSH have seen this. The latter has seen a rash like that of scarlatina, or like measles, in a very few cases. While LEVY and others have seen erysipelas coincident with the disease.

Such are the most important facts relating to the surface of the body which have been observed. It is to be remarked that none of these appearances are pathognomic, since, in the majority of cases they do not appear at all, or, at least, distinctly, and since many diseases, in many respects different from this one, present the same phenomena.

3. Vascular System.—The character of the pulse, generally speaking, from the beginning to the end, as noted by a large majority of observers, has been:—1. That of diminished force. 2. That of increased frequency, and, 3. Less frequently irregularities. By NIEMEYER, the pulse was found to correspond to the temperature. The pulse in cases where the temperature

was low, was observed, in a few cases, as low as 60 in a minute. The pulse was noticed by HIRSH, RUMMEL, and NIEMEYER as generally slow at the beginning of the disease, but more frequent as it progressed, especially in fatal cases.* Such was the experience of GALLUP and others in our own country, and of the French observers. This feebleness seems to be shared by the entire circulatory system, heart and bloodvessels alike. But exceptions occur. In one case, which proved fatal three hours from the date of attack, the pulse was normal in frequency, and was full, and so continued until after respiration ceased. This occurred in my own practice. Such cases, however, are very rare. *Hemorrhages* have seldom occurred. *Epistaxis* has, perhaps, been most frequently observed. LEVY, *e.g.*, says that out of 43 cases, 9 had epistaxis. Hemorrhagic spots also occur beneath the skin and mucous membranes, and sometimes beneath the serous membranes and into the texture of various organs, as will be shown more fully in the *post mortem* history of the disease.

4. Blood During Life.—It is a matter for regret, that the blood has not more frequently been examined. But in all the cases which have fallen under my notice, the fibrine has uniformly been increased in quantity, or above the normal standard, and the same remark has been true of the corpuscles. The color of the blood has almost uniformly been bright. In 4 cases, in which the blood was examined by ANDRAL and GAVARRET, the fibrine was found increased from 3.70 to 5.63, the normal standard being about 2.20; and the corpuscles from 134 to 143 parts in 1000, the normal standard being about 131. Dr. AMES, of Alabama, examined the blood in 4 cases, and found the fibrine from 3.46 to 6.40 in 1000. Mons. MAILLOT reports 6 cases, where the blood was examined by SOULIER,

* I shall make more frequent reference to some foreign monographs, than to the brief papers published in our own country, *only* because some of the former embody such exceeding careful, extended, and valuable observations. I am deeply indebted to the excellent monographs of RUMMEL, HIRSH, NIEMEYER, and KÖHLER. The latter is one of the most elaborate treatises ever published on all forms of cerebro-spinal inflammation. Their titles, with others, will be found elsewhere.

where the fibrine rose to 6 parts in 1000. I have, myself, had the opportunity to observe the same fact. In one case, blood was drawn the third day of the disease, it was the first bleeding. It coagulated rapidly, and with a clot which, for size, firmness, and thickness of the buffy coat, surpassed anything I have ever seen. The objection which has been made to such examples, that the blood was probably examined after the second or third bleedings, when we would be led to expect an increase of fibrine if it were true, as it is not, will, certainly, not apply to the corpuscles, since we should, for the same reason, look for a diminution of the corpuscles. But we have seen they are increased. Observations, tending to establish the same facts, have been made by M. FORGET, FAURE VILLAURE, and others. The buffy coat has been noted as often very considerable by numerous observers. Dr. AMES abstracted blood in 37 cases, and in all the color was unusually bright and the coagulation rapid. In 4 cases out of 37, he witnessed the buffy coat.

5. Digestive System.—The *tongue* is frequently normal, as mentioned by BROUSSAIS, *e.g.* Usually it has a whitish coat, sometimes creamy, and is moist. There are, however, numerous exceptions to this statement. After the disease has progressed for a time, and, rarely from the beginning, the tongue is yellowish or brownish, and, *sometimes*, dry. But in the latter stages of most cases, especially fatal cases, the tongue becomes brown, or even dark, and fissured and dry, and not unfrequently, in such cases, red, and, in a few examples, sordes collect on the teeth, lips, and tongue. BROUSSAIS reports the tongue brown or dark from the beginning, rarely. ALLEN has seen the tongue swollen, and presenting indentation along the margin.

The *stomach.* The most constant symptom referable to the stomach, is *nausea* or *vomiting.* Indeed, so early and so constant is this symptom, that it is one of the most characteristic of the disease. It is increased by assuming the upright posture. It is almost exclusively sympathetic, and is usually referable not directly to the stomach, but to cerebral disorder, and is generally accompanied by fever and headache. It almost inva-

riably occurs within the first two days of the disease. It generally passes away after a day or two, but may continue for several days, or recur at intervals. In a few cases, it has not been observed at all. There is, usually, nothing peculiar about the matters vomited, though bile has often been observed, as by Dr. ARMSTRONG, of Mobile. The appetite is variable, though generally impaired or lost. The bowels have generally been observed as constipated or normal. Diarrhœa seldom occurs, but has been observed, rarely, as severe.

6. Respiratory System.—But few symptoms occur here worthy of note. Most observers state, on the average the respirations are slower than natural in this disease, though there are marked exceptions. As the disease advances, especially in fatal cases, the respirations become more slow and laborious till death. They are also frequently irregular. At the commencement of the disease, and many times during its progress, the respirations become sighing and oppressed; or they may be increased in frequency, as was often observed by NIEMEYER and the French observers; but in uncomplicated cases they are normal, or slower than natural. It is scarcely worth while to mention that in a few cases bronchitis, or pneumonia, or simple engorgement of the lungs have occurred, indicated by the usual rational and physical symptoms and signs. But such complications have been, so far as I have examined, purely incidental.

7. Secretions.—It is matter for regret, that the state of the secretions, and especially that of the urine, has not more frequently been examined with care. The *quantity* of the urine, though somewhat diminished at various stages of the disease, was usually not far from normal. It has been seen increased in quantity, and of low specific gravity, by ALLEN, while on the contrary, HIRSH has seen it frequently, at the beginning, of of high specific gravity. Some few observers report it generally scanty.

Quality, so far as known, not far from normal. Dr. ROOKER, of Indiana, mentions a high color and excess of the urates, sometimes. HIRSH mentions one case, in which he saw a precipitate of the triple phosphates, and another, complicated with

typhus, in which the urine was deeply colored, was highly acid, and afforded copious turbid deposits of the urates. ALLEN generally found the urine smoky, albuminous, depositing sediment, and containing disorganized blood corpuscles. The urine of patients convalescing slowly was found, invariably, albuminous. Drs. LODGE and SAMUELS, of Marion, Illinois, report the urine sometimes albuminous.

The *perspiration* presents nothing peculiar. Some observers have seen copious perspiration at irregular periods of the disease, either general or partial. I have seen it most copious in those cases where the temperature of the surface was highest. Profuse perspiration has been, comparatively, oftenest observed by GALLUP, WALES, and ROOKER. The first two observers report a mawkish odor arising from the skin during perspiration.

8. Nervous System.—The symptoms referable to the nervous system are, almost beyond measure, the most conspicuous and important, and demand a large share of our attention. Whatever other symptoms are absent, referable to other organs, or systems of the body, symptoms which refer to the nervous system are never absent. As a general thing, all the functions of the nervous system give evidence of derangement at some period in the course of the disease. We shall range these symptoms under three heads:—1st. Motor. 2d. Sensory. 3d. Psychical.

1st. *Motor Disturbance.*—The state of the voluntary muscular system indicates the condition of the motor part of the cerebro-spinal nervous system. Two sets of phenomena appear: (*a.*) Involuntary muscular action in various degrees. (*b.*) Paralysis of motion. The former is by far the more frequent, and gives us, tonic spasm; clonic, or epileptiform spasm; and, finally, jactitation, or restlessness.

(*a.*) 1. *Tetanic, or Tonic Spasm.*—This is almost a constant symptom of the disease, and varies greatly, as to its extent and time of appearance. Rarely, cases have been seen without this symptom in any noticeable degree. It sometimes appears at the commencement of the disease; but commonly does not appear in any marked degree until after the onset. It is usually preceded by a sense of stiffness, occasionally of soreness, in the

affected muscles, far more frequently the former. HIRSH noticed painful twitchings to precede the rigid state of the muscles. It is also one of the most persistent symptoms, continuing many times far into convalescence. In a few cases it may disappear early, before death, or before recovery, but generally continues until death, or slowly disappears on recovery. Its appearance may be either gradual or sudden. The muscles almost invariably affected, are those of the back of the neck, and, next in order, the extensors of the back and flexors of the limbs. Cases have occurred, in which the muscles of the back have been alone affected, but they are rare. Trismus is, perhaps, next in order of occurrence. Cases presenting this symptom have generally proved fatal. Next in order, strabismus, perhaps, sometimes both eyes, generally one, and that one usually the left, according to HIRSH. It is almost without exception converging. Pleurosthotonos has been observed, as by M. LEVY, at Val de Grace. Contraction of the abdominal muscles, and of the flexors of one or more of the limbs, has been observed. Perhaps not anywhere, more appropriately than here, can we state the condition of the pupil. It is variable. It may remain normal, as has been observed by FORGET and others, and may be either contracted or dilated throughout the disease. But, generally speaking, the pupils are contracted in the early part, and dilated in the latter part, especially in grave or fatal cases. Occasionally, one pupil has been observed contracted, while the other has been dilated. [NIEMEYER.] In delirium, they are generally contracted or *variable*, and in some degree sensitive to light. In coma, they vary, but most times are dilated, and usually insensible to light. In rapidly fatal cases, in which coma appears early, and also paralysis, the pupils are generally dilated the whole course of the disease.

2. *Clonic, or Epileptiform Spasm.*—Convulsions are far less constant than tetanic rigidity of the muscles. We may have them of all degrees of severity, from simple tremors or twitchings of the extremities or muscles of the face, as recorded by HIRSH and others, to severe general convulsions. They may be partial, as of one arm, or leg, or finger, or of the face.

They may occur at any period of the disease, but are not seen in any marked degree in the majority of cases, perhaps. They are more frequent in young than adult persons.

Except in cases comatose from the beginning, or in which the coma is profound, there is generally restlessness. This must not be confounded with the tremors, etc., already mentioned. The latter are true convulsive movements, and may and do take place when the patient is wholly unconscious. The restlessness is due to the severe pain which is felt in a half-conscious state, just sufficient to arouse the patient to movements expressive of distress.

(*b.*) *Paralysis of Motion* is, comparatively, not frequent. It has been observed of various degrees, and at various periods of the disease. It is rarely general. Such cases are usually fatal. Partial paralysis is far more common. Hemiplegia and paraplegia have been observed. Paralysis of one limb has been noted, and paralysis of the muscles about the face often occur. Sometimes dysphagia, or loss of articulating power have been noticed. HIRSH and NIEMEYER have recorded cases of acinesia, paresis, ptosis, etc. Such cases as present the last two symptoms generally proved fatal.

Paralysis seldom appears at the beginning of the disease—usually after it has advanced somewhat—most commonly in the later stages. It may disappear suddenly, or persist until death, or slowly disappear with recovery, or, finally, it may prove persistent (though rarely) after recovery. This class of symptoms are, as a general thing, more unfavorable than the preceding.

2d. *Sensory Phenomena.*—For convenience, we may consider general and special sensation apart:—

1. *General Sensation Exalted—Hyperæsthesia.*—Most observers have met with cases in which hyperæsthesia was present, and some, as HIRSH, have met them frequently. I have seen two cases, in children, in which the hyperæsthesia was almost the only *well-marked* symptom. HIRSH has *always* found it when present, associated with *tonic contraction of the muscles.* It sometimes appears early and persists till late in the disease,

or into convalescence. It commonly affects the whole of the surface of the body, or nearly so, but may be partial. The surface is sometimes so painfully sensitive as that the slightest movement of the person, or simply touching the surface, or even a current of air produces excruciating distress, the patient complaining bitterly. This contributes to the restlessness and moaning of delirium, or even in somnolence or coma. It appears in some degree, either partial or general, at some period of the disease in, perhaps, the majority of cases.

2. *General Sensation Depressed—Anæsthesia.*—This is far more rare than hyperæsthesia. Like the latter, it may be either general or partial, and may disappear before death or recovery, but is seldom persistent. It usually occurs in the middle and later stages of the disease. In the cases observed by NIEMEYER, the mind was clear.

3. *General Sensation Perverted—Pain.*—Pain is one of the earliest and most common symptoms. Its most constant seat is the head. While it may be felt in any part of the head, its usual seat is the back part. It may be here, as elsewhere, various in character, but is generally severe, and is sometimes described as *terrible.* It is sometimes shifting in character. It is also persistent, being commonly one of the last symptoms to disappear in convalescence.

It is next most frequently observed in the back of the neck, where it partakes of the character of the pain in the head, but is not so constant. Next in order, is pain in the lumbar region, and after this, in the dorsal region and in the extremities. Pain is frequently referred to the peripheral extremity of a nerve, as to a limb, the face, etc. The only constant seat of pain is the head, though there have been exceptions. Pain in the abdominal walls was frequently and early observed by HIRSH. The pain was, as it generally is, increased by motion.

3d. *Special Senses.*—They are disturbed in a variety of ways and degrees. Impairment, and even loss of vision or hearing has not been uncommon. These disturbances might occur at any period of the disease, but generally in the middle and later stages, and in a few cases have proved persistent;

same may be said of the other special senses. An exploration, by means of the ophthalmoscope, of the interior of the eye, determining in this way the degree of vascularity of the choroid, would seem, in this disease, to throw some light on the state of the brain or its circulation.

4th. *Psychical Phenomena.*—1. Under this head, the symptom which is most common, is *delirium*, observed at various periods and in different degrees. Cases have occurred, in which no prominent symptom of mental disturbance has appeared during the whole course of the disease, but they are rare. Such are the purely spinal cases, in which the contents of the cranial cavity are slightly or not at all involved. While it may appear either at the outset, or in the middle or later stages, it usually appears in the early part of the disease. It is usually remittent, and may be intermittent, or may alternate with coma. [FORGET.] It may come on suddenly or gradually. It usually does not appear until after the chill, headache, etc. It is not so constant as these symptoms, though some deem it characteristic. It may, as already remarked, exist in various degrees, from simple mental wandering when undisturbed, to that the most violent. It may be pleasing or amatory, or such as leads the patient to be fierce and untractable. The delirium generally precedes the coma, but FORGET, *e.g.*, has seen it otherwise. When delirium is present, the pupils are seldom dilated, may be normal, but are generally contracted in some degree and variable, and, as already remarked, in some measure sensitive to light.

2. *Coma.*—This symptom is not so constant as delirium. Out of 46 cases, Mons. FORGET saw 8 cases where coma set in at once. It occurs with the least frequency in the beginning of the disease, most so in the later stages. It is a more unfavorable symptom than delirium, and usually, though not always, indicates effusion, serous or otherwise. Those cases in which decided coma occurs, comparatively seldom recover, whether it appears early or late. It may, like the delirium, prove remittent or intermittent, in the latter case alternating with delirium. During coma, the pupils may be normal, or even contracted

somewhat, though rarely. They are almost uniformly in some degree dilated and insensible to light. Coma may vary in degree, from simple dulness or somnolence to that the most profound.

9. Periodicity and Stages.—This disease is not characterized by well-marked stages. The symptoms are generally somewhat periodical or rythmical in their progress. This has been particularly noticed in localities where periodical fevers prevail. To such an extent has this been the case in some places, especially in the West, as to induce the belief among some physicians that it was a form of "pernicious" malarial fever. In such instances of the disease is it that the quinia treatment has proved so beneficial.

10. Duration.—The duration of the disease varies from a few hours, to weeks or even months. I have seen one case die within three hours from date of attack, and have seen another pass along for three months. RUMMEL remarked the disease to run its course sooner at the beginning of an epidemic, than at its close.

11. Mortality.—It is greatest during the first four days of the disease, and among the young; and at the beginning rather than at the close of the epidemic. HIRSH reports that of 391 fatal cases, 359 were under 15 years. NIEMEYER found that of 66 males, 20 died; of 60 females, 18 died; of 54 cases, from 1 to 5 years of age, 18 died; 40 cases, from 5 to 14 years, 9 died; 27 cases, from 15 to 23 years, 10 died; and in 5 cases, above 23 years, 1 died. The following mortality table of some of the epidemics in France, is mainly taken from the monograph of M. BROUSSAIS:—

Nancy,	8	deaths in	28	cases, are equal to		1 in 3.50
Le Mans,	3	"	9	" "		1 in 3.00
Ancenis,	4	"	12	" "		1 in 3.00
Mont Brison,	16	"	47	" "		1 in 2.93
Caen,	4	"	10	" "		1 in 1.25
Poitiers,	8	"	20	" "		1 in 2.50
Versailles,	111	"	227	" "		1 in 2.04
Metz,	22	"	40	" "		1 in 1.81
Perpignan,	28	"	50	" "		1 in 1.78
Strasbourg, (Mil. Hosp.)	108	"	184	" "		1 in 1.70
" (Inhab,)	90	"	150	" "		1 in 1.66
Laval,	44	"	69	" "		1 in 1.56

Colmar,	5	"	7	"	"	---------- 1 in 1.40
Bayonne,	21	"	28	"	"	---------- 1 in 1.33
Aigues Mort,	120	"	160	"	"	---------- 1 in 1.33

Thus, in 1035 cases, we have 592 deaths, or 1 in 1.76. In the Southern States, during the war, where the disease prevailed extensively, one instance is mentioned, where there were 66 deaths in 154 cases; another, where, out of 40, 24 died; and in 35 cases, reported by Dr. S. C. YOUNG, of Grenada, Miss., there was not one recovery. In the Southern States the mortality has been estimated at from 60 to 80 per cent. [GAILLARD, *Rich. Med. Jour.*, 1866.] Mons. GASSAUD, at Avignon, reports only 2 cases lost in 126! This he attributes to the free and early use of quinia.

12. Prognosis.—At *all* periods unfavorable, but especially so during the first four or six days. After this time, the prognosis would seem more hopeful. It is generally more grave in the sporadic than in the epidemic form; and, on the whole, is less grave than in well-marked cases of tubercular meningitis. The question of *diagnosis* will receive consideration in another part of this report.

13. Complications.—They are *general* and *special.* Among the former may be mentioned erysipelas, malarial influence, etc. HIRSH and RUMMEL did not notice any other epidemic or important general disease to coincide with the Dantzig epidemic. HIRSH saw one case complicated with typhus, and another with diphtheria. ALLEN has seen erysipelas as a common complication. The same observation has been made in various parts of this State during the late epidemic. Dr. ROOKER, of Indiana, has seen it occur in connection with diphtheria, and, moreover, has noticed where hog cholera has prevailed most, there this disease has prevailed most.

While many observers, and especially late German observers, have seen the disease rarely complicated with typhus, and deem it a distinct disease from typhus; on the other hand, it has been so constantly associated with typhus in the French epidemics, as to have led many of the French observers to identify it with typhus. This opinion is held by many observers and writers, both in Europe and this country. The examination of the

question, as to whether this disease is or is not a form of typhus, will be made in a subsequent part of this report. Such are the most interesting of the general complications which have been observed.

Among the *special* complications, may be mentioned pneumonia, which is the most frequent, perhaps. This complication seems to have been exceedingly common in the epidemic which visited New England in the early part of the present century. Cases of this kind have been often noted. But there does not seem to be any good reason for regarding the coincidence of these diseases as anything more than accidental, as may appear more fully hereafter. Out of nearly 1900 cases, HIRSH has only mentioned *one*. Inflammations of the joints, or of various other parts of the body, and, in some epidemics, of the serous membranes, have been reported by numerous observers. The latter seem to have been strikingly so in some of the French epidemics, and in some of the localities in the New England epidemics in the beginning of this century.

Such are the most important facts of the symptomatical history of "cerebro-spinal meningitis."

II. POST MORTEM HISTORY.

Here I have been able to collect the evidence afforded by not less than 200 cadavers, which is regarded as affording a sufficient basis for trustworthy generalizations. When they have been given singly and in detail, I have analyzed individual cases. As was observed regarding the symptoms which refer to the nervous system, it may be said of the *post mortem* changes, they are almost never absent from the cerebro-spinal cavity. To this part of the organism, so pointedly referred to by the symptoms, our attention will now be directed, to try if we can find in the after-death appearances any adequate explanation of the morbid phenomena during life.

1. *Central Nervous System and its Envelopes.*—The scalp has been frequently found congested, and beneath it, in some instances, extravasated blood; in other cases, nothing of the kind has been seen. The cranial bones, and especially the diploë, has been found deeply colored with blood in some cases,

and, in cases of some duration, NIEMEYER has seen a blue color of the cranial bones, in one case very intense. Occasionally spots of extravasated blood have been found between the cranial bones and dura mater. It has been more common to find effused blood and congestion on the outer surface of the dura mater of the cord, and in the areolar tissue and parts adjacent to it. Such does not occur in a majority of cases, in any marked degree.

1st. *Dura Mater and its Sinuses.*—While I have seen not more than two cases reported, in which the dura mater gave undoubted evidence of structural disease, I have seen no case reported, in which there was not abnormal fulness of its vessels, generally the sinuses and larger veins. In most cases, the sinuses, in particular, have been tumidly filled with blood of a dark color, and, most times, fluid in consistence, or devoid, for most part, of coagula, though not always the latter. *E.G.*, Prof. MAISCH relates a case, in which the blood in the sinuses presented firm coagula, which was true also for the blood in *all* the blood cavities. In *no* case, so far as I have, has seen an exudation been reported on the free or serous surface of the dura mater worthy of note, unless we mention an increase of the serous fluid in the cavity of the arachnoid which is sometimes colored or presents small flocks of lymph, but is usually not changed apparently, except in quantity. This is true for both the cranial and spinal dura mater. They almost never present *well-marked* evidences of *structural change*, or a *firm exudation* on the free or serous surface. Those cases where the congestion and injection of the dura mater was most decided, were found by HIRSH to be the cases where there was the smallest amount of effusion into the ventricles, and *vice versa.* NIEMEYER has seen a case, in which the texture of the dura mater was infiltrated with pus. With these exceptions, and a very few others of like kind, it has uniformly been reported healthy.

2d. *Arachnoid.*—The arachnoid has not often presented evidence of disease. *Generally* about normal, though sometimes discolored, or even apparently thickened and rendered in various degrees opaque. Its freedom from disease is, probably,

partly owing to the fact that it is so sparsely supplied with bloodvessels and nerves. The remark just made about its *post mortem* condition, will apply only to the *visceral* layer. The *parietal* layer, or that which lines the dura mater (if we regard this as an actual continuation of the arachnoid,) is almost uniformly healthy in its appearance. The cavity of the arachnoid, many times, does not seem to contain more than its normal quantity of fluid. But most frequently, perhaps, it is increased and sometimes discolored. Occasionally, it is excessive in quantity. When the arachnoid has been roughened, it has generally been the visceral surface of the visceral layer. As regards exceptional cases, NIEMEYER reports one in which the arachnoid was highly injected. He has found the fluid in the cavity of the arachnoid, in a proportion inverse to that in the ventricles. RUMMEL and a few others, have seen the arachnoid adherent to the dura mater; and Dr. G. A. MOSES, of Mobile, is represented in the *Richmond Medical Journal* of this year, as describing the arachnoid as almost always giving evidence of acute inflammation. I have not found it so in my examinations.

3d. *Pia Mater.*—Unlike the two cerebro-spinal investments just mentioned, the pia mater has almost uniformly presented the appearances of disease. Rarely, cases have occurred, in which no evidences of structural change or exudation have been observed, but *not one* where *congestion* has been absent. The rule is, that it presents the most indubitable evidences of disease. Those parts of it most frequently diseased are, at the base of the brain, about the optic commissures; the interpeduncular space behind the commissure; the pons Varolii and medulla oblongata; under surface of the cerebellum; and along the fissures of Sylvius. After this, the surface of the hemispheres is the most constant seat of disease. The congestion and the exudation, when present, may occur uniformly over the surface, or, as invariably happens with the latter, is found along the course of the sinuses, and bloodvessels, and large fissures, and along the fissures between the convolutions. Next, the pia mater of the cervical portion of the cord is most fre-

quently diseased, and of this part and the medulla, the *posterior aspect* is most often diseased. M. LEVY found in 44 cases, the posterior part almost exclusively affected in 27 cases. On the other hand, I have not noticed a case where the anterior half alone was affected. Next in order, the lumbar and lower part of the dorsal regions are most often affected; and, lastly, the pia mater of the dorsal portion seems most frequently to be free from disease. Sometimes cases have occurred, in which the spinal element has been absent, but the converse has been exceedingly rare.

4th. *Exudation—Serous.*—Except in some cases, where death has occurred either with extreme suddenness, or in cases of long standing, there is found to be an increase of the sub-arachnoid fluid, especially at the base of the brain. In recent cases, it consists in a simple increase of the natural fluid, but in most cases, it is colored yellowish or reddish by pus or blood, and varies in quantity, from a few drachms to several ounces. It varies in consistence and has been found by M. FORGET almost gelatinous. Small flocks of lymph, pus, and blood corpuscles, etc., as already intimated, are often found. It is most abundant where there is the least effusion in the ventricles, and *vice versa.* In cases of several weeks' duration, the membranes have been found unusually dry.

5th. *Exudation—Plastic.*—Except in those cases where death seems to have taken place too soon to permit of such a result, there has been found more or less plastic exudation, most abundant in such places as have been already indicated. It varies in consistence, extent, color, etc. It may be a soft, friable, pus-like layer, or have a gelatinous consistence, or be firmer yet, as coagulated fibrine. It may be nearly transparent, or have a grayish color, being in various degrees opaque, or may have a white or creamy appearance, or be tinged various hues by either pus or blood or both. It may cover a large extent of surface, or be disseminated in patches here and there. But it is always, when present, found along the course of the large vessels and the fissures, and about the roots of the nerves, whether the cranial or spinal, the posterior roots of the latter,

in particular. It is, when present, on the surface of the pia mater, but may be infiltrated into its structure, or beneath it, into the nervous substance for a short distance. It varies in thickness, from a mere film to a line or two, or more. Its consistence depends much on the duration of the case, being most so in cases which have some duration.

In the exudation the microscope has revealed free nuclei, and thin walled cells containing two or three nuclei. [MAISCH.] In the *American Medical Times*, for April 30th, 1864, a case is reported by Dr. FROTHINGHAM, in which the exudation showed no pus corpuscles. But WUSCHENDORFF and other observers have seen pus corpuscles, as we will see hereafter, perhaps.

6th. *Ventricles.*—The ventricles have generally been observed with more than the normal quantity of fluid in them; occasionally, the quantity has seemed to be normal. It has been found to vary from a small increase to several ounces, and in a case reported by Dr. READING, the quantity was so great the ventricles were ruptured. M. TOURDES saw, in 44 cases examined at Strasbourg, 26 in which the ventricles were distended; and in 44 cases examined by M. LEVY, at Val de Grace, 18 presented distended ventricles. NIEMEYER mentions a case, where the ventricles contained as much as six ounces of fluid.

The character of the exudation has varied from clear serum, sometimes mingled with pus, or colored with blood and the like, [FORGET, LEVY, BROUSSAIS, HIRSH, RUMMEL, NIEMEYER, DRAPER, etc.,] to the purulent and gelatinous exudation already described as occurring on the pia mater, and which frequently extends into the anterior and posterior, and even the middle, horns of the lateral ventricles, and is found in the other ventricular cavities. [NIEMEYER.] The exudation generally occupies the *floor* of the ventricular cavity.

The walls of the ventricles are frequently injected, which seems most often true of the roof of this cavity. The plexus choroides is nearly always injected and bathed in the exudation, as the optic thalami and striated bodies also are. The ventric-

ular walls have been found softened, and ALLEN speaks of having seen ecchymosed spots in them.

7th. *Nervous Substance.*—This, in the majority of cases, has been reported as healthy. Occasionally it has been seen paler than natural, in cases of some standing in particular. [NIEMEYER and others.] More frequently it has been seen congested in various parts and degrees. FORGET has found in chronic cases, a turgescent state of the brain matter, and in more recent cases, some injection of the nerve substance. The same appearances are, substantially, given by M. BROUSSAIS. M. LEVY found in 44 cases, injection of the nervous substance 9 times. NIEMEYER has met with cases, in which the brain was of a dark or a light red color. HIRSH has seen a case, in which the brain generally was injected; one in which the great ganglia, at its base, and another, in which the cerebellum was alone injected. LIDDELL reports congestion in one case; and the cases reported by Dr. READING were all of them more or less so. The latter observer twice saw what seemed to be an abscess of the cerebellum—collections of pus in the cerebellum —in one case, nearly a gill. The *spinal cord* sometimes participates in this congestion.

Softening, has occasionally been reported in chronic cases. NIEMEYER records it in 2 cases out of 15. One of the cases was of 49 days standing, and exhibited cheesy metamorphosis. M. CHAUFFARD observed softening, comparatively often, at Avignon. DRAPER mentions one case of partial softening. In three of Dr. READING'S cases, the brain was softer than natural. The brain and spinal cord have rarely been seen œdematous. NIEMEYER and DRAPER, each report a case. Dr. HUTCHINSON reports a case, in the *American Medical Journal*, for July, 1866, etc. The convolutions have been observed flattened in long-standing cases, by M. FORGET; also, he has seen the convolutions adherent, one to another. A similar case is reported by NIEMEYER. The same remarks are true, though less frequently, of the spinal cord.

2. *The Chest.*—The chest has yielded no characteristic evidences of disease, and, in the majority of cases, perhaps, nothing

strictly abnormal. In many cases, the common hypostatic congestion has been observed in the lungs. M. LEVY has seen 9 cases out of 44. But occasionally the lungs have been found deeply congested with dark blood. Such was true in the case reported by Dr. LEVICK, and in two cases reported by Dr. LIDDELL. The latter gentleman found about four ounces of serum in either pleural cavity in one case. Pneumonia was found twice by LEVY, in 44 cases. Dr. READING reports 1 case in 7, where marks of pleuro-pneumonia were present. In 3 of the 4 cases examined by Dr. J. C. WARREN, he found extensive thoracic lesions; in one, double pleurisy, with extensive purulent deposits. M. BOUDIN says, it was no uncommon thing to have purulent deposits in any or all the serous cavities, especially the tunica vaginalis. The pericardium has been occasionally found congested, as in one case reported by GERHARD, and one each by READING and WARREN. M. BILLERY, at Grenoble, speaks particularly of the lesions of the pleural and synovial cavities. In the case of GERHARD and some few others, spots of extravasated blood, were seen in the structure of the pericardium. Others have found the amount of serum increased, even to several ounces. [LEVY, FROTHINGHAM.] This comprises most of the thoracic lesions I have noticed. They were far more common in the French and New England epidemics than I have learned them to have been elsewhere. In the late German epidemics, *e.g.*, they were comparatively unknown.

3. *Abdomen.*—The organs within the abdomen have usually presented nothing strikingly abnormal. The stomach has almost uniformly been found healthy or paler than natural.

NIEMEYER has seen the mucous coat congested. In the majority of cases the small intestines give some evidence of disease. This is generally slight hyperæmia, especially in the neighborhood of vascular parts, as the patches of Peyer and the intestinal glands. LEVY reports slight enlargement of Brunner's and Peyer's glands in about one-third of the cases he saw. Much the same, by FORGET and BROUSSAIS. The former saw one case of ulceration of the intestines. NIEMEYER reports much the same. TOURDES, at Strasbourg, saw two cases of

ulceration in 46, and 32 of the cases showed some slight follicular lesions, while 8 showed none of any kind.

Hemorrhagic or ecchymosed spots have been found occasionally. Once by NIEMEYER, in the great end of the stomach. In a few cases, ecchymosed spots have been observed in the intestinal walls, or mesentery, etc. [LEVICK, JEWELL, (of Pa.) NIEMEYER.]

The liver, spleen, and kidneys have generally been found healthy. But cases of congestion in various degrees are reported. [NIEMEYER, RUMMEL, LIDDELL, etc.] In Dr. LEVICK'S case, the kidneys and bladder presented ecchymosed spots. In two of Dr. LIDDELL'S cases, the bladder contained urine charged with albumen. The urine, under such circumstances, was observed by NIEMEYER to throw down a copious sediment In 4 cases, in which the kidneys were submitted to the microscope, Dr. DRAPER reports fatty degeneration. It was observed in one case, that of a little girl who died 44 hours from date of attack. There were no signs of previous disease in these cases. The serous membrane lining the cavity of the abdomen, has generally been found healthy. In some cases, it has presented evidence of disease. This was true, for example, in some of the epidemics in France.

4. *Vascular System.*—The heart and bloodvessels have seldom presented anything worthy of note. The heart has sometimes been found paler than natural, in others increased in color, and, rarely, softened. In the large majority of cases, the blood found in the cavities of the heart and bloodvessels has been darker and more fluid than natural. In a few cases, extreme fluidity has been observed. [JEWELL, (of Pa.) LEVICK, LIDDELL.] But M. FAURE VILLAURE, at Versailles, found generally large yellow fibrinous clots, in the heart in particular. The same was often observed at Strasbourg, in the province of Landes, Nancy, Lyons, Colmar, etc., in 1837. The blood drawn during life at these places, exhibited much buffy coat. In the case reported by GERHARD, small coagula were observed, as they also were in the cases reported by Dr. DRAPER. NIEMEYER has seen clots in several cases; and in one

case examined by Prof. MAISCH, already referred to, *very firm clots* were found throughout the vascular system, *even in the sinuses* and large vessels within the cerebro-spinal cavity.

Various other appearances have been noted by observers. The muscles have most times, perhaps, appeared natural, occasionally paler than natural. A few observers report them redder than natural. [GALLUP.] The muscles which have been contracted, as those of the back of the neck, have been found redder, or darker, and softer than natural. The same muscles were observed by RUMMEL to be least rigid after death. Extravasated blood has been observed, not unfrequently, in spots in the structure of various organs.

Such are the *most important post mortem* appearances noticed by observers, either in this country or Europe. This summary of facts, as remarked in the beginning, has been drawn from not less than 200 cases.

III. ETIOLOGICAL AND PATHOLOGICAL HISTORY.

Proceeding as we only can safely, as a rule, in medicine, from *effects* to *causes*, with the materials and facts from the foregoing analysis before us, we are ready to begin the discussion, as to the *causes* and *nature* of the disease. In doing this, I shall invert the order of discussion observed thus far, in beginning with certain general propositions, and under each shall collect the particular evidence on which it rests. These propositions are really the conclusions reached, but have been arranged in the manner which follows, for convenience of discussion. The nature of a disease is to be determined from the phenomena or *effects* perceived and its *causes*. The former I have endeavored to show, in part, in the above analysis. The *effects* having been presented, let us now turn to the *causes*, as the next step in the enquiry.

In the class of diseases to which this seems to belong, to determine causes, satisfactorily, is confessedly one of the most difficult tasks in pathology, and nowhere is more *positive* light required, than on the question of epidemic causes in general. Such causes, while they are clearly matters of inference, are, thus far, mainly *unknown*, as regards positive evidence. We

are obliged to admit their existence, but can offer but little, if any, direct proof of it.

1. I proceed, then, to remark, in the first place:—That the disease depends primarily, in all probability, on a specific external epidemic cause, unknown, save in its effects. Various known external causes, either singly or combined, have been assigned to this disease, such as cold, foul air, social misery, insufficient or bad food, change from civil to military life, fatigue, nostalgia, abuse of alcoholics, depressing agencies of various kinds, heat of the spring sun, crowding in small houses with defective ventilation, and many others, have been assigned by different observers, not only as *predisposing*, but also as *efficient* or *essential* causes. That such agencies may and do predispose the system to the inroads of disease, whether the one under consideration or any other, by impairing the energies of the organism, there can be no reasonable doubt. But that any of the causes of disease mentioned above, or others of a like kind, are capable of *originating* this disease, seems exceedingly doubtful, as will appear from the following considerations:—

In general, it may be remarked, in relation to such assumed causes, that they exist thousands of times without either producing or being accompanied by "cerebro-spinal meningitis." This is a matter of almost daily observation, and to suppose they should at one time produce the disease, and *not* at other times, is destructive of the very idea of causation. On the other hand, the disease has prevailed many times in the absence of, at least most, if not all these assumed causes.

The disease, for example, as regards cold, has often been prolonged into the hot season, and has even begun as an epidemic, and prevailed extensively, in midsummer, as many as eight times, in France. It has prevailed in rural districts as well as civic districts, and has even seemed to prefer rural districts in some cases, as in our own late epidemic. It has appeared among both rich and poor; on the uplands as well as lowlands; among those well fed, as well as among those poorly fed; among those who have enjoyed thorough ventilation, as well as those under an opposite condition; among the civil, as

well as military population, and so in relation to the whole catalogue of these known assumed causes, of which the malady seems to be wholly independent, except that they may, in a general way, predispose to, or intensify it. As we shall see, the disease has an individuality sufficiently well marked and constant to necessitate the conclusion, in so far as it presents constant phenomena, that it is due to a constant cause, which cannot be alleged of any known cause. For *not one* of them has been observed to be constantly associated with the disease. Since, then, we are bound to admit a cause, we can do no other than conclude, if the essential cause be external or exopathic, it is one, which, though unknown directly, is special, and, by reason of its apparent independence of known external conditions, and its wide field of operation, must be assigned to that obscure but admitted class, *epidemic causes.*

But the cause may not be external. It may be internal or autopathic. Such causes may be either *predisposing* or *essential.* Our concern at this time is particularly with the latter. Among autopathic causes, may be mentioned:—

1st. *Age.*—While no age has been exempt, the young have been the principal victims, and, as a general thing, the younger the age, the greater the mortality. The period between 10 weeks and 7 years, has furnished a greater mortality than any later period of equal length. But, in Berlin, according to HIRSH, the disease was mostly confined to the adult population. In other instances, the period from 18 to 24 has yielded a larger mortality, than from 10 to 18. But, as a whole, the disease has prevailed vastly more among the young, vigorous, healthy, and athletic, than among the aged or infirm. At Belfast, *e.g.*, Dr. MAYNE says, the disease was almost exclusively confined to boys, between the ages of 7 and 12. Most of the cases seen by HIRSH, were below 15. The same was observed in the epidemics in Denmark and Sweden, and at Stettin and Bromberg. Reports of the same tenor, have been made by NIEMEYER, RUMMEL, and others. At Rochefort, according to LEFEVRE, the greatest mortality was between the ages of 30 and 40 years; at Strasbourg, between 14 and 21; at Aigues

Morte, Val de Grace, Gibraltar, Lisle, etc., much the same. For further matter on this topic, see the paragraph on mortality, above. It must be remembered, however, that the mortality reports made in France, in some cases refer almost exclusively to the military population, in which case we would, of course, expect the greatest mortality at a period necessarily different from what we might have it among the civil population.

2d. *Sex.*—All reports, so far as I have seen, represent the disease as prevailing most among males—in a few cases, almost exclusively so.

3d. *Hereditary Influence.*—There are no good reasons to suppose they play any part as essential causes of the disease, though it is possible they may exert some influence as predisposing causes.

But, in this case, it may be, something has been *retained* in the blood, which should normally have been removed from it by some one or more of the emunctories of the body, as urea, *e.g.*, by means of which the blood is poisoned, and becomes the cause of the disease. Or, the blood *may* have undergone some change in *quantity*, either as a whole, or in respect of some one or more of its constituents. Or, some change may have taken place in the *quality* of the blood or some of its constituents, in which cases it might be rendered unfit, on the one hand, to maintain a healthy state of the structures, and, on the other, a positive cause of disease.

As regards the first case, it may be remarked, that so far as the evidence goes, there does not appear to be any change in the secretions, either as a whole or in respect to their ingredients, sufficient to account for the phenomena of this disease. The urine, for example, has usually been reported healthy in appearance, and nothing concerning the other secretions worthy of note.

It is true a few observers have seen, especially in the later stages of the disease and during convalescence, albumen in the urine, and sometimes a deposit, more or less copious, of either the urates or the phosphates. [Niemeyer, Rooker.] But other observations do not accord with these, and, besides, the same

conditions appear in forms of disease not even analogous to this. It must also be remembered, that it generally requires some time to effect such a change in the secretions as, in this way, to produce marked symptoms, while this disease frequently has its whole progress from a state of apparent health to a fatal termination in a few hours. And it would be of no avail in the present case, were we to show that even marked alterations of the secretions had occurred *during* the *course* of the disease, unless it could also be shown they appeared before the onset of the disease. The evidence is pretty conclusive that the essential cause of the disease is not to be found in retained secretions.

2. That the blood has been deprived to any considerable extent of its elements, or that there has been a considerable quantitative change at any stage of the disease, does not appear from the evidence to be a fact, or even probable in any noteworthy degree.

3. That some change has been wrought in the blood or some of its chief constituents, by which it acts unhealthily on the living structures of the body, seems highly probable, as will appear from the following facts and considerations. The particular changes which have been observed under different circumstances and at different times, are as follows:—

There has been found in all the cases examined, uniformly, an increase of fibrine, and, generally, of the corpuscles, as we have already seen, before death. As regards the condition of the blood after death, we have seen that, while in the large majority of cases the blood is not only darker, but also more fluid than usual, that, on the contrary, in some well-marked cases, it has not been so, as in the case of Prof. MAISCH, in which the blood was firmly coagulated in the heart and vessels. But that this change of color and fluidity noticed in the blood of most cases after death, is not a *cause* of the disease, but, on the contrary, only a *part* of the disease, seems quite certain, for the evidence goes to show a *contrary* state of the blood during the life of the patient.

As already remarked, the corpuscles are notably increased, as shown in the cases examined, from 131, about the normal

standard, to 136 or even 142 parts in 1000. But whether or not they have undergone any change *per se* is matter of conjecture, since the evidence does not show. But, in most cases, it would seem hardly possible for a change to occur, either here or in the fibrine, or any other known constituent of the blood, with the suddenness which would be required to explain the frequently abrupt onset of the characteristic symptoms of the disease. Except the *color* of the blood before death, which is unusually bright, generally, and a very few unimportant facts relating to other changes, neither striking nor constant, these are all. Now, so far as we know, blood-changes quite similar to these take place in other forms of disease different from this, and in whatsoever relation we regard these blood-changes to the disease, they must have a cause, and this cause can scarcely be other than external. But we have found already that there is no evidence that the ordinary or positively known causes of disease have any direct share in its production.

It is thus seen, that the probabilities are against the existence of any *positively known* external cause, and that what is known of the state of the blood and secretions would hardly justify us either to say that the blood, because of its changes, became the *cause* of the train of symptoms and morbid appearances observed, or were *themselves initiated* by an internal cause. If these remarks be just, it must follow that we adopt, as the only alternative, an external cause as the essential one. That this must be the truth, farther appears, because:—

1st. The disease is so widespread in its prevalence, and occurs under such a variety of circumstances, and in these respects so nearly resembles undoubted epidemic diseases, as cholera, and presents such characteristic phenomena as to make it alike impossible for us to explain them by any known external cause or by any changes in the blood, the which, if they do occur, constitute rather a *part* of the disease than the initial or starting point in causation. We are thus forced to hypothecate a cause, such as the phenomena require.

2d. The suddenness of the attack is *so* marked, and its progress to a fatal termination so rapid, and the affection of the ner

vous system, as shown by the symptoms and the *post mortem* appearances so early and so constant, as to beget the belief that some energetic poison has been introduced into the system, because we know how many poisons may be and have been taken into the system, which, if they have not produced the same, have, nevertheless, produced symptoms so far similar as to leave no reasonable doubt in our minds that the symptoms of this disease have been produced in some similar way.

The leading symptoms and appearances are so constant, the sphere of operation so wide, and the attack, in many cases, so sudden, as to require a generality and uniformity of causation, which can be secured in no other way than by admitting as true the proposition we began with. This examination of the question of causation will not appear superfluous to those who are familiar with the discordant opinions held on this subject.

The next proposition I would lay down, is:—That it is a disease *sui generis*, a disease essentially different from and independent of other recognized forms of disease.

That this is not the opinion generally held, will appear by showing what are the opinions which have been and still are held by numerous eminent members of the profession, both in this country and Europe. That the disease is only a form of typhus, has been held by a large majority of European writers, perhaps, as well as by many in our own country.

Among the former, may be mentioned HILDENBRAND, PRINGLE, OZANAM, SYDENHAM, LEFEVRE, MATTOT, BILLERY, CHAUFFARD, BOUDIN, BROUSSAIS, MURCHISON, AITKIN, and many others. Among the latter, WOOD, DRAKE, DRAPER, and others.

That the disease is simply a form of the ordinary "congestive" or "pernicious" malarial fever, has been the opinion of many physicians practising in the paludal districts of the West, and of some few *writers*, apparently, as MARSHALL HALL, (Prac. Med.) Others have supposed the disease identical with erysipelas in its essential nature. Others have supposed the disease simply malignant scarlatina; while another thinks it quite probable the causes of diphtheria and hog-cholera are identical with the cause of this disease. On the other hand, several

observers in this country and Europe believe it to be a disease *sui generis.*

These diversities of opinion show us the necessity of a careful examination of the *facts* relating to the disease. It is for want of this that we have such contrariety of opinion. While a broad survey and analysis of the facts from different times and places will show that a *certain group* of symptoms and appearances are never absent in any case, it will, on the other hand, show that the disease has often had imparted to it a peculiar hue or tendency, so to speak, by the prevailing "constitutions" and diseases, as the typhus, malarial, etc., so much so, many times, as almost to mask the characteristic symptoms of the disease, as was observed in relation to typhus in the French epidemics. Or, as we have seen, it may be complicated with some other form of disease, as pneumonia, as was observed in the epidemic which prevailed in New England, in the early part of the present century. The only one of the opinions above referred to which seems to demand a careful examination, is that which holds "cerebro-spinal meningitis" to be identical with typhus. That the two diseases are not identical, will appear by drawing a parallel between their symptomatical, *post mortem*, and etiological histories:—

CEREBRO-SPINAL MENINGITIS.	TYPHUS FEVER.
I. *Symptomatical History.*	*Symptomatical History.*
1. The attack is sudden and the progress, as a general thing, rapid. A few exceptions occur.	1. Attack almost never sudden. Progress generally slow. Average duration 21 days. The "blasting typhus," which visited the French army at Saragossa, Torgau, and Wilna, were simply unusual *exceptions*, and as such they do not establish a *rule.*
2. The secretions not much disturbed, as a general thing.	2. Secretions almost always much disturbed.
3. Generally introduced by a decided or severe chill.	3. Generally begins with rigors, but not often decided chill.

4. Heat of surface does not, on the average, rise above normal. Color, usually not far from natural. Face generally pale in early part of disease, but sometimes flushed or cyanotic.

5. Spots do not often appear. Vary as to kind, duration, time of appearance, disappearance, etc. Seldom elevated. No sudamina.

6. The blood drawn during life has always shown a firm coagulum, bright color, and often a decided buffy coat. Analyses have shown a marked increase of fibrine and corpuscles.

7. Tongue generally not brown or dry, unless in later stages.

8. Vomiting almost a constant symptom early in disease, almost exclusively sympathetic. Bowels generally normal or constipated.

9. Respiration not always, but on the average, *slower* than natural.

10. Urine generally not far from healthy in quantity and quality.

11. Tonic spasm of extensors of back of neck, and back, and flexors of limbs, almost al-

4. Heat of surface *does* rise above natural, the average being so high as 107° Fah. "Calor mordax," surface and especially *face*, always *dusky*, often positively muddy. Face usually flushed, and expression dull.

5. Spots pretty constant and generally elevated (rubeoloid.) Appear from 5th to 8th day. Remain for 11 or 12 days. Above 20 years, spots all but constant.

6. Blood drawn during life loosely coagulated. No buffy coat worthy of note. Fibrine and corpuscles both evidently deteriorated. The *former* diminished and the corpuscles variable.

7. Tongue generally brown or dry almost from commencement.

8. Seldom vomiting. Diarrhœa frequently.

9. Respiration not always, but on the average, more frequent than natural.

10. Urine seldom normal in quantity or quality.

11. Neither tonic or clonic spasms are present, only very rarely.

ways present. Clonic spasms not unfrequent. Paralysis of motion sometimes present.

12. Hyperæsthesia is quite frequent and often general. Anæsthesia sometimes present.

13. Pain in the head often "*terrible*," and always *severe*. Worst in *back* of head, neck, and spine.

14. Special senses *often* markedly disturbed, and in many ways.

15. Delirium almost constant in early part of the disease, and *active*. Mental faculties and senses not always dull.

II. *Post Mortem History.*

1. The only constantly diseased appearances are those found in the cerebro-spinal cavity.

2. Pia mater constantly shows unhealthy appearances.

3. Exudation always present where time is given.

4. Ventricles often diseased.

5. Serous exudation frequently abundant.

6. Blood generally dark in color and fluid in consistence, but not always.

III. *Etiological History.*

1. Is *not essentially* affected

12. Marked hyperæsthesia seldom present. The same of anæsthesia.

13. Pain in the head *not* severe usually, and more often in *front* of the head.

14. Special senses *not* markedly disturbed.

15. Delirium *not* constant and not always active, but low or muttering, rather. Mental faculties and senses almost *always* dull.

Post Mortem History.

1. No constant diseased appearances, unless those of the blood. "*Other* lesions may be considered incidental." [Wood.

2. Does not show such often.

3. Exudation *not* always present; on the contrary, comparatively seldom.

4. Ventricles seldom diseased.

5. Seldom abundant.

6. Blood *always* fluid and dark.

Etiological History.

1. *Is* affected essentially by

by, or dependent *on*, *known* external conditions.

2. Depends on a peculiar epidemic *external* cause, without reasonable doubt.

3. Affects all ages and both sexes, but prevails *most* among males, and the *young*, vigorous, and healthy.

4. Prevails in all conditions and districts—in the country, as well as the city.

5. Neither contagious nor infectious, in all probability.

known causes and external conditions.

2. Does *not* seem to depend essentially on a peculiar external epidemic cause.

3. All ages and both sexes, but *most* among *adults*.

4. Almost exclusively among the poor, ill-fed, and in overcrowded localities; comparatively seldom in the country.

5. Certainly contagious under some circumstances, and is probably infectious.

[*Continued in the next No.*]

Book Notices.

A Guide to the Practical Study of Diseases of the Eye; With an Outline of their Medical and Operative Treatment. By James Dixon, F.R.C.S., Surgeon to the Royal Ophthalmic Hospital, Moorfields, London. From the third London edition. Philadelphia: Lindsay & Blakiston. 1866.

This is a neat little volume of 400 pages. The former editions of the work have been long enough before the public to be familiar to the reading part of the profession. It is concise, plain, and practical; just such a manual on diseases of the eye as the student and practitioner will find convenient and useful. For sale by W. B. Keen & Co., 148 Lake Street. Price $2.50.

Instructions in the Preparation, Administration, and Properties of Nitrous Oxide, Protoxide of Nitrogen, or Laughing Gas. By Geo. T. Barker, D.D.S., Prof. of Principles of Dental Surgery and Therapeutics, in the Pennsylvania College of Dental Surgery, etc., etc. Philadelphia: Rubencame & Stockton. 1866.

This is a monograph of 61 pages, printed on plain type and good paper. It is a very useful work for all such as desire familiar and reliable instruction in regard to the best methods of preparing and administering the Nitrous Oxide Gas.

THE PHYSICIAN'S VISITING LIST FOR 1867. Philadelphia: LINDSAY & BLAKISTON.

This very great convenience for the practitioner has been so long and so generally in use by the profession, that its merits are well known. For sale by W. B. KEEN & Co., 148 Lake Street. Prices—For accommodating 25 patients, in cloth, 75 cents, in leather, $1.25; for 50 patients, in cloth, $1.00, in leather, $1.50.

MANUAL OF MATERIA MEDICA AND THERAPEUTICS: BEING AN ABRIDGEMENT OF THE LATE DR. PEREIRA'S ELEMENTS OF MATERIA MEDICA, ARRANGED IN CONFORMITY WITH THE BRITISH PHARMACOPŒIA, AND ADAPTED TO THE USE OF MEDICAL PRACTITIONERS, CHEMISTS AND DRUGGISTS, MEDICAL AND PHARMACEUTICAL STUDENTS, ETC. By FREDERIC J. FARRE, M.D., Cantab., F.L.S., Fellow of the Royal College of Physicians of London, Honorary Member of the Pharmaceutical Society of Great Britain, Examiner in Materia Medica and Pharmacy to the University of London, etc., etc. Assisted by ROBERT BENTLEY, M.R.C.S., F.L.S., Honorary Fellow of Kings College, London, Prof. of Botany, etc., etc.; and by ROBERT WARINGTON, F.R.S., F.C.S., Chemical Operator to the Society of Apothecaries, and Vice-President of the Chemical Society. Edited, with numerous references to the U.S. Pharmacopœia, and many other additions, by HORATIO C. WOOD, JR., M.D., Prof. of Botany, University of Pennsylvania, Auxiliary Faculty of Medicine; Member of the American Phil. Society, etc., etc., etc., etc. With 236 wood engravings. Philadelphia: HENRY C. LEA. 1866.

This, though an abridgement of Dr. PEREIRA'S original work, is, nevertheless, a ponderous volume of 1030 pages. It is published in good style, in substantial leather binding. The four editors and assistant editors, British and American, have so altered, abridged, and modified the original work, that we doubt whether, if Dr. PEREIRA were alive, he would recognize much in the present edition as his own work. It is, however, a convenient and very valuable treatise on materia medica.

For sale by W. B. KEEN & Co., 148 Lake Street.

Editorial.

Clinical Instruction in Chicago.—When the writer came to this city, in the autumn of 1849, there was nothing bearing the name of a hospital in it; and the clinical instruction was limited to one or two college clinics per week, during the annual lecture term of sixteen weeks. The following summer, he aided in the procurement of *twelve* beds, in a building rented temporarily, for the beginning of a public hospital, and in the autumn of 1850, commenced the work of hospital clinical instruction. This constituted the beginning of what has since been known as Mercy Hospital, and which has been increased until it now holds permanent possession of one of the finest buildings and locations in the city. It is constantly well filled with patients, under the immediate care of the Sisters of Mercy, with the professors of Practical Medicine and Surgery in the Chicago Medical College as its medical and surgical attendants. Its wards are open for clinical instruction four days in the week, during nine months of each year, *viz.:*—from the first Monday in October, to the first Monday in July. The full clinical course in this hospital constitutes an essential part of the curriculum of the Chicago Medical College.

In addition to this, Chicago now affords clinical instruction, two days in each week, in the United States Marine Hospital, by Dr. R. N. Isham, Prof. of Surgical Anatomy and Operations of Surgery, in the Chicago Medical College; two days in each week, in the Cook Co. Almshouse Hospital, by Dr. J. P. Ross, one of the attending physicians, and Dr. G. K. Amerman, one of the attending surgeons, and in the eye and ear ward, once a week, by Dr. Hildreth, the attending surgeon in that department; and one day in each week, in St. Luke's Hospital, by the attending surgeon, Dr. Owens. Both the colleges also maintain two clinics per week, on patients from their respective dispensaries. We have made this enumeration, simply to remind the students and profession in the North-west, that in no city East,

West, or South, can the student find better advantages for true bedside clinical instruction than here in Chicago.

MORTALITY FOR THE MONTH OF AUGUST.—

CAUSES OF DEATH.

Accidents,	11	Fever, Typhus,	1
Bronchitis,	1	Fever, not stated,	3
Burned,	3	Fever, Childbed,	2
Cancer,	3	Hydrocephelus,	6
Childbed,	5	Inflammation of Kidneys,	1
Cholera,	139	Inflammation of Brain,	16
Cholera-Morbus,	15	Inflammation of Bowels,	15
Cholera Infantum,	25	Inflammation of Lungs,	13
Colic,	1	Inflammation of Pleura,	1
Congestion of Brain,	5	Killed,	1
Congestion of Lungs,	3	Measles,	47
Consumption,	33	Old Age,	15
Convulsions,	37	Paralysis,	1
Cramp,	9	Pneumonia,	3
Disease of Brain,	3	Rheumatism,	2
Disease of Heart,	2	Scrofula,	1
Disease of Liver,	5	Small-Pox,	1
Disease of Spine,	2	Stillborn,	11
Delirium Tremens,	2	Summer Complaint,	217
Decline,	3	Suicide,	2
Dropsy,	12	Teething,	37
Diarrhœa,	38	Tuberculosis,	1
Diphtheria,	7	Whooping-Cough,	63
Dysentery,	29	Worms,	1
Erysipelas,	1	Unknown,	31
Fever, Remittent,	19		
Fever, Scarlet,	17	Total,	940
Fever, Typhoid,	14		

AGES OF THE DECEASED.—Under 5 years, 578; over 5 and under 10 years, 46; over 10 and under 20, 34; over 20 and under 30, 78; over 30 and under 40, 78; over 40 and under 50, 48; over 50 and under 60, 27; over 60 and under 70, 25; over 70 and under 80, 7; over 80 and under 90, 2; over 100, 1; unknown, 16. Total, 940.

NATIVITIES.

Chicago,	548	France,	4	Sweden,	9
Other States,	127	Holland,	3	Unknown,	2
Canada,	9	Ireland,	69		
Denmark,	6	Norway,	28	Total,	940
England,	12	Bohemia,	10		
Germany,	98	Scotland,	4		

DIVISIONS.

North,	252	South,	297	West,	386
County, (out of city),	3	Unknown,	12	Total,	940

Number of deaths in July,	706
Increase,	234
Number of deaths August, 1865,	466
Increase,	474

REPORT OF THE COMMITTEE ON THE SANITARY CONDITION OF THE CITY, AND THE PREVALENCE OF DISEASES, DURING THE MONTH OF JULY, 1866.

By N. S. DAVIS, M.D., of Chicago.

Read before the Chicago Medical Society, August, 1866.

Atmospheric Conditions.—During the first seven days of July, the winds were from the south and south-west; the temperature high; more or less rain every day, except the 4th and 5th; atmosphere excessively damp and deficient in electricity, inducing in the animal system a feeling of languor and oppression. The only change during these seven days, was on the evening of the 2d, when the wind suddenly changed to the north-west, bringing a cooler atmosphere during the night, but which was again reversed in the morning. On the 8th, the wind had changed to the north-east, and the atmosphere continued chilly and damp through the day. 9th, wind from the north, and, atmosphere still cold, clear, and less damp. 10th and 11th, wind south-east; atmosphere warm, but clear, dry, and pleasant. From the morning of the 12th, to the evening of the 17th, the wind was from the south and south-west; the atmosphere continuously hot, damp, and deficient in free electricity, inducing a marked feeling of oppression and weakness. About 1 o'clock P.M., of the 17th, the wind suddenly changed to the north-east, bringing a cool, damp atmosphere, and a slight sprinkle of rain; and in the evening, copious showers, with thunder and lightning. During the 18th, 19th, and 20th, the wind continued north and north-east, with a cool, clear, but somewhat damp atmosphere. During the evening of the 20th, it became cloudy, with the wind more to the south. 21st, wind south, cloudy, hot, and oppressive, with copious showers in the evening, followed by a cool north-east wind, and a fine display of atmospheric electricity. About midnight, the wind again changed to the south, and the morning of the 22d was hot, rainy and oppressive. The 23d, 24th, 25th, only moderately warm, and wind mostly east and north-east, but showers occurred every

day or night, keeping the air saturated with dampness. The 26th, 27th, and 28th, the wind was almost continuously from the south; the atmosphere filled with clouds, mist, and sometimes rain, and very hot. During the night of the 28th, the wind changed to the north, and the 29th 30th, and 31st were cool, for the most part clear and pleasant.

It will thus be seen, that the most prominent meteorological characteristics of July were, high temperature; frequent rains; excessive dampness; south and south-west winds, with deficient free atmospheric electricity. The principal exceptions to this rule were from the 17th to the 21st, and from the 29th to the 31st. The average temperature of the month was here, as in most other sections of our county, above the average of the preceding ten years. I have been particular to mention the direction of the winds, because those from the south, south-west, and west come over an almost continuous rich, alluvial prairie surface, and in the summer always bring an atmosphere not only elevated in temperature, but deficient in both electricity and ozone. Its effects upon the human system are popularly expressed by the words, *relaxing, sultry, oppressive.* Those from the east, north-east, and north, sweep over an equally continuous surface of fresh, pure water, extending 40 miles east and hundreds of miles north; and in summer never fail to bring a cool, invigorating, though often damp atmosphere.

In regard to local sanitary conditions, it is proper to state that, although the scavenger system adopted by the city authorities has served to keep the streets and alleys of the central part of the city some cleaner than in former years, yet up to the last day of July there were extensive sections of the city, thickly covered with dwellings, in which not even a street gutter had been cleaned out; and both branches of the Chicago River have been in their usually offensive condition. As might have been anticipated, from the local and atmospheric conditions just detailed, the prevalence of intestinal diseases in the city, during the month of July, has been much above the average of the preceding three or four years.

In a preceding report, it was stated that from the 20th to

the 27th of June there was a prevalence of south winds, with a hot, damp, and oppressive atmosphere, during which, "serous diarrhœa and dysentery increased rapidly among young children, and to some extent among adults." The cool invigorating atmosphere of the last three days of June checked this tendency in some degree, but the renewal of the hot, damp, and showery weather, during all the first seven days of July, again increased rapidly the number of attacks of cholera-morbus, cholera infantum, diarrhœa, and dysentery. During the 6th and 7th, particularly, the attacks of bowel-affections were not only numerous, but they were accompanied by unusual languor, prostration, and sweating. The days were hot, cloudy, with some rain, and slight wind from the south. Two cases of sun-stroke were reported on the 7th.

On the night of the 6th and morning of the 7th, I saw three or four children presenting symptoms of great prostration; countenances pale; pulse slow and weak; respiration slow and inefficient; mental faculties dull or in a state of semi-sleep, from which it was difficult to arouse them; occasional sighing and momentary restlessness; but with little or no evacuations of any kind. Their paleness and apparent lifelessness was the chief cause of alarm to the parents and friends. I have noticed a few similar cases during the first extremely hot days and nights of almost every summer. They appear to be the result of a deficiency of atmospheric oxygen and electricity, coupled with the relaxing influence of a high temperature. During the 8th, 9th, 10th, the number of new attacks of bowel-affections was decidedly less, and most of those that did occur, presented the form of dysentery. But from the 11th to the 17th, the cases of serous diarrhœa and cholera-morbus, especially among children, increased so rapidly that two-thirds of all the patients that came under my observation during that period were of this class.

Among my daily entries in the note book, is the following: "During the night of the 16th, the air was very hot and relaxing. Both that and the preceding night, children with bowel-complaints became very restless and prostrate, with discharges

thin as water. Several were taken suddenly prostrate, drowsy, and feverish, without any discharges." Other periods of rapid increase of new attacks took place during the 21st and 22d, and from the 26th to the 28th, inclusive. According to my notes, four-fifths of the cases of serous diarrhœa and cholera-morbus that occurred during the whole month, had their *commencement* either between the 1st and 7th; the 11th and 17th; 21st and 22d; or the 26th and 28th, while the cases of dysentery occurred more evenly throughout the month. If these dates are compared with the detail of atmospheric conditions, it will be seen that a hot and damp atmosphere invariably accompanied the unusually rapid multiplication of cases of serous diarrhœa and cholera-morbus. Are these atmospheric conditions, coupled with the idio-miasmatic influences generally present in densely populated cities, capable of causing attacks of genuine spasmodic cholera? As bearing on this question, I will simply relate the following facts:—

On the night of the 7th of July, one of the most oppressive that occurred during the month, a lady living at 160 Western Avenue, on the extreme western limits of the city, began to have disturbance of the bowels with serous discharges, which culminated in severe cholera symptoms on the night of the 8th, including the characteristic rice-water discharges, by vomiting and purging; severe cramps in the muscles of the extremities and abdomen; a small, weak pulse; skin shrivelled and cool; voice husky, etc. Under appropriate treatment she recovered.

Case II. On the morning of the 10th, was called to Mr. L., at 200 Huron Street, in the North Division of the city. He was then presenting all the symptoms of the active stage of spasmodic cholera, but which had been preceded by moderate diarrhœa since the evening of the 7th.

Case III. On the morning of the 11th, a lady from Kansas arrived at the Adams House. She had been much fatigued by the long journey, and had suffered from a moderate diarrhœa during the three preceding days. Soon after her arrival, the diarrhœa began rapidly to increase, and at noon, she was presenting every symptom of severe cholera. The discharges up

and down were copious, rice-water in appearance, and accompanied by severe muscular cramps in the extremities. Two hours later, when I first saw her, the eyes were deeply sunken; the extremities cold and skin shrunken; the pulse extremely weak; the voice reduced to a whisper; the cramps severe; and the intestinal discharges wholly involuntary. Under treatment, the discharges ceased, reaction took place slowly, and the patient ultimately recovered.

Case IV. A man, aged about 20, baker by occupation, residing at 172 West Lake Street, was attacked suddenly, during the afternoon of the 12th. The cholera symptoms were strongly marked and violent in every respect. I saw him about two hours after the commencement of the attack. His system responded promptly to the action of medicine, and he recovered. The day was excessively hot, and the man had indulged in drinking eight or ten glasses of beer, and two or three of brandy, besides a considerable quantity of water.

Case V. Mr. K., aged about 55 years, long in infirm health, was attacked with violent symptoms of cholera on the night of the 6th. When I saw him, on the 7th, he was in collapse. Partial reaction took place, and he lingered until the 10th, when he died. He resided on the corner of West Indiana and Sangamon Streets.

Case VI. Mr. W., aged about 45 years, residing at 245 Madison Street, was attacked on the night of the 15th. Early in the morning of the 16th, I found him presenting all the symptoms of the active stage of genuine cholera. But he responded to the action of remedies and recovered.

Case VII. Mr. D., aged 35 years, intemperate habits, residing on Franklin Street, near Jackson, was attacked on the night of the 15th. When I saw him, early in the morning of the 16th, he appeared to be in the commencement of collapse. Reaction, however, took place; he lingered several days with symptoms of secondary fever, but finally recovered.

Cases VIII., IX., X. On the morning of the 22d, I was called in quick succession to three cases of adults, who had been suddenly attacked during the latter part of the night pre-

vious with vomiting, purging, cramps, etc. They were seen during the early part of the active stage, and readily yielded to treatment.

Such were the indications of cholera in this city during the month of July, as they came under my own observation. The cases were not reported to the Health-Officer, because they were sporadic, having no connection with each other or with any importation from other places, and because they gave no evidence of being either contagious or infectious. But if these cases originated from atmospheric and local causes, why may not a more active development of the same causes give rise to the same disease in its more malignant and epidemic form? The only difference I could detect between these sporadic cases and cases of cholera in the midst of an epidemic, consisted in less depression of vital susceptibility, and a consequent more prompt response to the action of medicines.

That the month of July was attended by a much greater proportion of bowel-affections than usual, is apparent from the very great increase of mortality during that month. The whole number of deaths for June was 319, and for July 706; the excess in the latter month being almost wholly from bowel-affections.

THE CHOLERA CASES IN THIS CITY DURING THE MONTH OF SEPTEMBER, 1866.—The subjoined report of the Health-Officer, gives the number of deaths from cholera, in this city, during the past month, showing the number for each ward, their nativity, and ages:—

Nativity.—United States, 33; Bohemia, 9; Canada, 2; Denmark, 2; England, 6; France, 2; Germany, 110; Holland, 1; Ireland, 66; Norway, 19; Poland, 1; Sweden, 5; Switzerland, 2; Spain, 1; Scotland, 1; Italy, 1; unknown, 11. Total, 272.

Wards.—First Ward, 20; Second Ward, 21; Third Ward, 19; Fourth Ward, 16; Fifth Ward, 9; Sixth Ward, 15; Seventh Ward, 21; Eighth Ward, 8; Ninth Ward, 5; Tenth Ward, 5; Eleventh Ward, 19; Twelfth Ward, 37; Thirteenth Ward, 3; Fourteenth Ward, 35; Fifteenth Ward, 20; Sixteenth Ward, 14; unknown, 2. Total, 272.

Ages.—Under 5 years, 15; over 5 and under 10 years, 22; over 10 and under 20, 15; over 20 and under 30, 64; over 30 and under 40, 74; over 40 and under 50, 40; over 50 and under 60, 23; over 60 and under 70, 7; over 70 and under 80, 1. Total, 272.

Chicago Medical College.—The Eighth Annual Course of instruction in this Institution commenced on Monday evening, Oct. 1st. The exercises commenced with prayer by the Rev. Dr. Goodspeed. The general introductory lecture was given by Prof. M. O. Heydock, and was an elegantly written address. The lecture-room was well filled with an attentive and interested audience. After the lecture, the museum, library, and other rooms were thrown open for the inspection of the visitors. Every part of the edifice was in excellent order, and supplied with everything that could contribute to the convenience and progress of the student. The number of students present was much larger than at the commencement of any previous term since the college was organized.

Disinfection and Deodorization.—Dr. Herbert Barker, the successful competitor for the Hastings Prize Essay for 1865, was led, by a series of observations and experiments on this subject, to the following conclusions:—

1. For the sick-room, free ventilation, when it can be secured, together with an even temperature, is all that can be required.
2. For rapid deodorization and disinfection, chlorine is the most effective known.
3. For steady and continuous effect, ozone is the best agent known.
4. In the absence of ozone, iodine, exposed in the solid form to the air, is the best.
5. For the deodorization and disinfection of fluid and semi-fluid substances undergoing decomposition, iodine is best.
6. For the deodorization and disinfection of solid bodies that cannot be destroyed, a mixture of powdered chloride of zinc, or powdered sulphate of zinc with sawdust, is best. After this, a mixture of carbolic acid and sawdust ranks next in order, and following on that, wood-ashes.
7. For the deodorization and disinfection of infected articles of clothing, etc., exposure to heat at 212° Fahr. is the only true method.
8. For the deodorization and disinfection of substances that may be destroyed, heat to destruction is the true method.—*Journal of Chemistry.*

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Oct. 1866. 1y. **CHICAGO, ILL.**

MIAMI MEDICAL COLLEGE

OF CINCINNATI.

ANNOUNCEMENT FOR SESSION OF 1866-7.

The next Regular Session begins Oct. 15th, 1866, and will close March 1st, 1867. There will be Preliminary Lectures and Clinics at the Commercial Hospital, from and after Oct. 1st. The next Course of Lectures will be given at the new College, on Twelfth Street, between Elm and Plum.

FACULTY:

GEORGE MENDENHALL, M.D., Professor of Obstetrics.

B. I. RICHARDSON, M.D., Professor of Diseases of Women and Children.

JOHN A. MURPHY, M.D., Professor of Practice of Medicine.

HENRY E. FOOTE, M.D., Professor of Anatomy.

WM. H. MUSSEY, M.D., Professor of Operative Surgery and Surgical Pathology.

WM. CLENDENIN, M.D., Professor of Military Surgery, Surgical Anatomy, and Principles of Surgery.

E. WILLIAMS, M.D., Professor of Ophthalmology and Aural Surgery.

JESSE P. JUDKINS, M.D., Professor of Special Pathology.

C. B. CHAPMAN, M.D., Professor of Chemistry, Toxicology, and Medical Jurisprudence.

EDWARD B. STEVENS, M.D., Professor of Materia Medica and Therapeutics.

WM. H. TAYLOR, M.D., Professor of Physiology, Pathology, and Morbid Anatomy.

CHAS. P. WILSON, M.D., Demonstrator of Anatomy.

GEO. S. COURTRIGHT, M.D, Prosector to Anatomy.

J. C. CULBERTSON, M.D., Assistant to Chemistry.

FEES.—For the Professors' Tickets, $40. Matriculation, $5. Demonstrator's Ticket, $5. Hospital Ticket, $5.

For circulars or any information, address

GEORGE MENDENHALL, M.D., Dean, 196 4th St.,

sep2t. **or E. B. STEVENS, M.D., Sec'y, 319 Elm St.**